CHEMICAL INDUSTRIES

FORMERLY KNOWN AS "CHEMICAL MARKETS"

VOLUME XXXIII NOVEMBER, 1933 NUMBER 5

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CHEMICAL INDUSTRIES is published monthly by Chemical Markets, Inc. WILLIAMS HAYNES, *President;* H. H. ADAMS, *Vice-President;* WILLIAM F. GEORGE, *Secretary-Treasurer.*

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CHEMICAL INDUSTRIES

VOLUME XXXIII NUMBER 5

A Message to the President

BUSINESS is standing still because it is afraid to go forward. Most of our business people believe this quite sincerely and we wish, Mr. President, that you would consider carefully the causes of the profound sense of insecurity that grips us all.

Your re-employment campaign has put many back to work and raised wages. It has, however, created a wholly artificial labor market, advancing abnormally the price of manufactured goods, and moreover quite recent European experience proves that to shorten hours and increase wages by law only temporarily assists workers and does not restore general prosperity. As shown by the industrialists' reluctance to sign codes and by the labor leaders' reliance upon strikes, neither welcomes the Government in the labor situation and to inject labor questions into politics will raise an undesirable, un-American issue.

During the War and since, here and abroad, we have witnessed an unprecedented series of attempts to maintain or to raise the price of all sorts of commodities. Whether undertaken for private gain or public good, with or without the support of the most powerful Governments, not one of these efforts has been successful and several have been disastrous, costly failures. Most of the nations are now "managing" their currencies and yet none has been able to restore prosperity to its people by monetary methods, while every one which has passed through a serious inflation is determined at all costs not to repeat that ruinous experiment. You are attempting to raise prices artificially and you have the power radically to change the value of our dollars. Without the most definite assurances from you neither buyer nor seller is willing to make future commitments either for the commonest current supplies or for the execution of plans involving capital expenditures.

You are spending billions upon public works. Thoughtful business men are deeply concerned at the prospect of impairing the credit of the United States and the certainty of long years of heavy taxation to meet even the carrying charges of these huge expenditures.

Consider, Mr. President, these three things—the Government's labor policy, your control of our money, the federal budget—and look at them realistically from the point of view of our manufacturers and our merchants, the greatest creators of our national wealth, the employers of most of our labor, the taxpayers upon whom fall the heaviest burdens.

Future Prices on Chemical Contracts New contract prices are tardily announced and on the average show a very modest increase of about five per cent. which certainly does not cover corresponding increases in costs of other industrial raw materials. The general policy of writing contracts for future delivery at this very reasonable advance for six months with at the end of that time a mutual reconsideration of the contract on the basis of the then existing costs, regulations and taxes, is also very much more favorable to the industrial purchaser than similar adjustment clauses in other commodities. Certainly no chemical buyer has any grounds for complaint either that prices or terms are being stiffened under the protection of the Blue Eagle.

We May or We Must The letter of the National Recovery Act says that industries "may draw up codes of fair competition". Clearly Congress intended to permit such industries as chose to do so to curb competition in ways forbidden by the anti-trust laws but by means which the approval of the President would guarantee fair treatment of labor and protection of the public interest. What is permissive in the law has become compulsory in its administration. Quite regardless of the fundamental constitutionality of this remarkable statute, there is clearly no legal compulsion for any industry to organize under NRA, which explains at once the ballyhoo and bluster of the Administration and why it avoids legal battle with a worthy foeman.

This translation of "may" into "must" explains also the growing unpopularity of all that the blue eagle represents. With but few exceptions our industries and trades have been dragooned into NRA. The strike epidemic testifies that labor prefers to trust to its ancient weapons rather than depend upon beneficent bureaucracy. The general public's quick repudiation of the nasty boycott suggestion, their concern over the liberty of the press, their failure to "crack down" on code violators, and their increasing resentment at advancing prices, all bespeak a growing lack of sympathy with NRA. The big and politically important farm group are already at open war with NRA and all its works.

We are not yet sufficiently demoralized to give up individual initiative and transfer to bureaucracy all economic responsibility. If we were willing to put hours and wages, production and prices all under Government control, we might achieve economic security. But we should sacrifice our economic liberties; and reduced to a personal basis, our farmers do not relish the security of the serf and our workers in both plants and offices will not accept guild security upon the terms of guild restrictions.

In its present form the NRA program will collapse because Americans, employers and employees alike, refuse to work in the chain gang for three square meals a day. If the tangible, permanent benefits of this program are to be salvaged, the "must" in all its words, its deeds, and its spirit, will have to be speedily revised to "may." Only upon these terms is economic cooperation possible between Government, Business, and Labor. Compulsion, legal or extra-legal, will turn us into a nation of economic bootleggers.

Worth-While Safety Planning Greater attention to safety will unquestionably be one of a number of permanent effects of the present "socialization of industry" movement. In plain language, aside from the very important humanitarian aspects, it is going to cost industry more to permit accidents to happen. So important is safety to plant efficiency and economy that CHEMICAL INDUSTRIES is well justified in devoting several pages of this issue to a symposium of the leading papers delivered at the recent National Safety Council Meeting in Chicago.

Great progress has been made in safety work. But can anyone believe for an instant that final objectives have been reached when five men can die cleaning a tanning vat—as recently happened in New Jersey? The most progressive chemical companies, with well-informed safety directors employed, constantly find new problems to solve. Nevertheless conditions in the less progressive plants leave much to be desired and chemical companies particularly are not economizing when they either withdraw or fail to join the Chemical Section of the National Safety Council. Membership is not an expense, but an investment. Yet 42 companies thought it necessary to discontinue membership; fortunately 20 companies found it desirable to join.

Our primary obligation is to put our own national house in order and by restoring our own balance to re-establish our great social groups. By so doing we shall make our best contribution to a sane and realistic internationalism.—*Wallace B. Donham.*

Hours, Wages and Chemicals

The more automatic and continuous an industry's operations, the more sensitive it is to hours and wages and Williams Haynes has drawn some illuminating comparisons from the experience of the European industries with government control of labor conditions.

In $100 worth of chemicals "naked at the plant" there are $10 in labor and $47 in raw materials and fuel. The average for all American manufactured goods is $15 in labor and $42 in materials and power.

These are the round figures of the last five U. S. Census of Manufacturers and may be considered reasonably accurate. They certainly express graphically the familiar fact that the costs of labor in chemical manufacture are less-than-average. Upon this basis it has been glibly assumed that the labor problem need not seriously concern our chemical executives.

This is a dangerous half-truth. While it is true that chemical labor costs have been comparatively low and the industry, operating universally upon the open shop basis, has been singularly free from labor disputes, nevertheless chemical costs are highly sensitive to hours of labor and both costs and production are very gravely affected by a shut-down. The implications in the whole NRA program of drastic change among the relationships that have existed between hours, wages and chemicals are very plain.

More than this, the whole idea of fixing by law the minimum of wages and the maximum of hours is a new experience for American industrialists. To purely economic factors it adds sociological considerations, and as it has already done in England and Germany, it will thrust the labor question into American politics. It cannot but complicate the tangled problems of technological unemployment and a wider spread of consumer buying power. For legal wage fixing—again the European experience is clear—in its attempts to raise the economic status of the laborer puts a premium on all sorts of labor-saving devices.

Indeed, save for a very temporary advantage, labor does not profit by these well intended schemes to raise wages artificially above the market. Furthermore, since the continuous, automatic process is the logical end of chemical technique, as chemicals and chemical processes are used more and more in the fabricating industries, chemical executives must expect to find themselves more and more involved in this snarl of conflicting tendencies. Chemical industry has been a great contributor to the conservation of raw materials and to the saving of both time and labor. It promises greatly to further industrial progress of this sort in the immediate future. Therefore our technical developments, following perfectly natural economic tendencies, will impinge sharply against many current theories and some recent practices.

It is timely, therefore, to consider the fundamental relationships between hours and wages and chemicals. If we are led to some speculative thinking about the future, there is certainly good precedent today for that form of mental activity. In this difficult period of economic transition it is but good sense to be guided by all the experience that we can gather, both from the past and from contemporary developments abroad; and it is prudent to study in the light of that experience, the probable results of changes.

Our present labor system is but one hundred and fifty years old. Until quite recently, and even now only in the industrialized countries of Europe and North America, there was no such thing as free labor; that is, the right of a man to live where he wishes and to do the work he wants for cash wages he has the choice of accepting or refusing. Throughout the ten centuries of feudalism the peasant was bound to the land on which he was born. The craftsman inherited his father's trade and was tied fast by all sorts of guild regulations. Before that the work of the world was done by slaves. European industry has inherited class traditions from the feudal system, and the great growth of population during the past two centuries has made labor the most abundant and cheapest of the three economic essentials—labor, land, and capital.

In this country, freed from medieval customs and prejudices, every man has had free and theoretically equal economic opportunity, and despite great floods

of immigration, labor has always been scarce and dearer than either land or capital. Our whole labor background has thus been quite different, distinctively American, inspiring a spirit of individualism, and of necessity promoting, wherever possible, the use of machines for manpower. In Europe all the influences have made for low wages. In the United States, the more our industries employed machinery and chemicals, the less important the factor of labor costs became; and the high wages always paid created a market for the mass production of all sorts of goods above the level of bare sustenance. It is quite natural that the conception of the workman as a consumer as well as a producer was born in our midst.

Since the war, however, our basic economic position has changed. Industry has supplanted agriculture as our chief means of producing wealth and as our largest employer of labor. We have ceased to be an international debtor and become a creditor nation. Our population growth rate has slowed up and immigration has been by law restricted. From 1923 to 1929 the wages paid by American industry remained almost constant ($11 billions to $11.4) while the value of our manufactured goods rose about 15 per cent. ($60.5 billions to $69.4). Moreover, even in good times, we had apparently two to three million workers chronically unemployed. These changes, it must be admitted, make the American labor situation quite different from what it had been.

Wages vs. Hours

At the opening of the century, wages of $14.40 for a 72 hour week were quite the general rule in American industry. In 1926 the national average was $23.22 for a 50.2 hour week. In May 1933, after four years of depression, the average wage was $14.42 for a 30.4 hour week with an estimated unemployment of 10-12 million.

In the chemical industry, which normally employs about a quarter of a million plant operatives, the wages in 1926 were 52c an hour for 53.4 hours, or a weekly wage of $27.72. During the studies made in formulating the Chemical Code, it was carefully estimated that the present average is 44c for a 42 hour week, or distinctly higher than the general industrial average and quite close to the NRA 40c and 40 hours.

Very briefly sketched, this is the American labor situation. Let us now check over some of the basic economic factors and see how they square with recent labor theories and the exigencies of chemical plant operation.

From the practical point of view of the industrial executive the true cost of labor is not measured only by the hours-wage scale. It is the ratio of that scale to investment in plant and apparatus plus the quantity plus the quality of the output per man. These factors differ from industry to industry, and even from plant to plant in the same industry. It is a fallacy therefore to base wages on the selling cost of the goods (as many economists and most socialists have proposed) or to attempt to establish (as the President's Re-employment Agreement required) uniform wage scales for all industries or even for all plants within a given industry.

It also follows that mechanization lowers the direct labor charges. But mechanization increases the investment required in plant and equipment. Accordingly, while the economic sensitiveness of an industry to the wage rate declines with mechanization, the effect of hours worked upon costs is thereby increased. This effect of hours upon costs is greatest where the plant investment and consequent interest charges, the depreciation and the obsolescence, are greatest, and where the individual efforts of the operative have the least effect upon the quantity or quality of the output.

Flexible Working Day Essential

On all four counts chemical industry is extremely sensitive to hours. Chemical apparatus is comparatively costly. Chemical reactions often literally chew up expensive equipment and are always carried on only at an excessive rate of depreciation. The double threat of new products and improved processes makes chemical obsolescence abnormally high. In any automatic chemical process the skill, the strength, the energy of the workman has but a minimum effect upon the output of the plant. An increasing number of chemical operations can only be economically run on a 24 hour schedule. As a graphic demonstration let us cite a very simple case where physical depreciation on a piece of apparatus is at the rate of 5c an hour, and interest and obsolescence 40c a day. These charges are ten cents an hour for 8 hours operation; 8 1/3c an hour for 12 hours; and 6 2/3c for a 24 hour operation.

Moreover, a flexible working day is essential in several branches of the chemical industry. The vital seasonal demands of the fertilizer and the alcohol (anti-freeze) markets are well known. Von Beckerath, the German economist, has collected many similar examples and pointed out that since 1923 the inflexible regulation of minimum hours has been of necessity continually liberalized in the German labor laws.

The German experience with what has come to be known in Europe as "political wages" is also to the point. After the Revolution that followed the war, the Social Democrats became a potent political power and at their instigation a number of labor laws have been enacted, some of them quite similar to some of the provisions of our own National Recovery Act, and others identical to proposed legislation we hear discussed around us on all sides today.

Minimum wages fixed by law have been observed to increase at first the use of labor-saving machinery. In the Ruhr coal mines 46 per cent. of the coal was mined by machine in 1927. Two years later this

machine output had risen to 83 per cent. But controlled wages prevent the building up of a cash surplus for replacements, and since they make it difficult to raise outside capital, they eventually hamstring industry. Nor do they increase the buying power of labor, because this kind of mass consumption can only be successful if the price level does not rise, or when the industry is not subject to foreign competition. Thus a natural result of artificially raised wages is a demand for higher tariffs. They also tend to induce the wasting of natural resources. Those mines, oil wells and forests which can be exploited at least labor cost are worked hardest. The potash mines are being stripped of their richest, easiest veins in just this fashion, a squandering of natural resources which can only be justified if there is a reasonable prospect of the discovery of new sources or of the perfection of new technique or substitute materials which will seriously depreciate the raw material in question. Unless the petroleum industry, for example, is convinced that the hydrogenation of coal is a dangerous threat in the gasoline market, to waste oil reserves in order to save labor costs would be a damaging economic crime.

Since the war England, like Germany, has made many experiments in attempts to raise wages higher than the markets warrant. Restricted hours, minimum wages, unemployment insurance, compulsory collective bargaining, and public arbitration of labor disputes have all been enacted. Industry, in both countries, has met these uneconomic costs by merger to reduce plant investments; by faster turnover, to reduce inventory charges; by employers' associations, to treat with unions; and by every possible labor-saving device. The fate of English coal in the European markets and of English cotton goods in the Orient; the desertion of free trade for a protective tariff; the voluntary reduction of wages which has been agreed to by over a million workers each year since 1928, are all direct results of these efforts to inflate wages.

Protective Alliance

A curious result of compulsory collective bargaining, observed in both England and Germany, has been the development of a sort of protective alliance between employers and workers. These take the form of exclusive, mutual work-employment contracts in which a certain group of employers (members of a cartel or an employers' association) agree to hire only the members of a certain union or group of unions who in turn pledge to work only for this particular employing group. This scheme is the essence of the famous English Alliance, and it is successfully in operation in the German printing and lace industries. How quickly such ideas are transplanted to America is shown by the identical proposal among the house-wreckers, where the code of the wrecking contractors stipulates such an agreement with the wrecking unions.

Other efforts to temper the effects of rigidly fixed hours and wages in Europe have been made through sliding wage scale agreements between employers and unions. These are sometimes based on selling prices and sometimes on profits. Their effect has been to bring the manufacturers and labor into a tacit conspiracy to mulct the buying public; but as the tendency of such a move is towards higher prices all along the line, such agreements turn out to be something of a boomerang in the hands of the workmen.

In the United States we have a highly charged, largely artificial situation. The Secretary of Labor has reported that 2.2 million factory and shop employees returned to work between March and September and the President of the American Federation of Labor credits the NRA re-employment campaign with putting 2.8 million back on the industrial payroll. Miss Perkins estimates the increase in these payrolls to have been eight per cent. during the past five months. The rather inadequate labor statistics at our disposal are unfortunate, but balanced against carloadings, power consumption or any of the other accepted indexes of production, these estimates reveal how artificial the movement has been. This is, of course, the measure of the success of NRA as a relief measure, and toward this primary objective long steps have certainly been taken.

Do Strikes Lead to Prosperity?

The strike epidemic, hailed by some as a sure forerunner of returning prosperity, would seem to indicate that the labor leaders fail thoroughly to appreciate the present inflation of the labor market, while among the rank and file it bespeaks at once a widespread dislike of the share-the-work idea when imposed by outside agencies and a general distrust of the Government as savior and protector of labor. These attitudes are doubtless much more significant than any indication of a business up-swing which the strikes they have inspired may foretell.

American labor leadership has been very able from the point of view of immediate, selfish advantage; but save from Samuel Gompers' patriotism during the war, it has lacked the elements of either political or economic statecraft. Union membership, which had dropped in 1929 back to the pre-war average of about two million, has since last spring leaped up to the 1920 peak of 4,078,740. Doubtless it will pass that figure, but with union leaders claiming an NRA monopoly of labor's collective bargaining rights and the Administration veering it away from this idea, a different basic situation will develop when business gets going again on a sounder basis of real demand. Abroad, laws shortening hours have not cured unemployment, and laws fixing wages have not restored prosperity. Some of these experiments are ten years old. On the other hand, laws requiring collective bargaining and arbitration have forced labor into an alliance with capital either in the form of a sort of

revived guild system with mutually monopolistic work-employment contracts, or sliding scale wages based on sales or profits. To date the rank and file of American workmen have certainly shown little inclination to be regimented into a modern edition of the medieval crafts, despite the power and economic security such a system assures them, and unless the federal government comes out flatly in support of the unions, there are plenty of well informed observers in Washington who expect a turn-about in the present stampede towards A. F. L. organizations. General Johnson's warning that public sentiment would be alienated from the union cause by use of the strike at this time has been repeated by other Government officials and warmly seconded by the press of the country.

Just at the moment, the threatening problem of technological unemployment is quite over-shadowed by the pressing problem of depression unemployment; but it looms in the offing. Chemical executives know that much progress in methods and machines has been made since 1928 which is available for installation in 1934. Such technical improvements increase the productive powers of industry, but although they lower costs, they do not increase purchasing powers until the labor originally displaced by them has been reabsorbed in industry. This may be accomplished in three ways: (a) the released credit of the lower cost industries is employed to expand other industries or start new industries; (b) the increased profits of the original industry seek investment in new fields; (c) money wages are lowered opening new fields of employment.

What Technological Unemployment Means

Technological unemployment is essentially the displacement of labor by capital. It is promoted by arbitrary or artificial raising of the wage scale on the one side or by a decline in interest rates on the other. The vital point is the ratio between labor costs and capital costs. The effect of technological unemployment is a dislocation of production costs and the result is that labor becomes over-priced. It follows that men thrown out of work because of new or improved technique will more slowly be reabsorbed if wages are held rigid while credit is flexible; and also that the better the control of prices, the greater the strain on wages.

It is not until the technologically unemployed are reabsorbed that the country at large profits from the lower costs, greater production, and cheaper goods that result from this improvement. Yet it has been chiefly through just such improvements in the various techniques of production that our hours of labor have been shortened and our wages increased. One must be a very deep-dyed pessimist not to believe that progress in all these directions will not be made in the future; but only a silly optimist sees the balance re-established by some political magic or social miracle.

The Industry's Bookshelf

Labor Relations Under the Recovery Act, by Ordway Tead and Henry C. Metcalf, 259 p., published by McGraw-Hill Book Co., 330 W. 42 st., N. Y. City. $2.00.

This book aims to supply practical guidance to all who are interested in methods of organized dealing with employees in industries and companies which come or may come under the provisions of the National Industrial Recovery Act.

Although its primary interest may be as a working manual for employers, executives of trade associations, and personnel managers, the book should also prove clarifying to all public spirited citizens who want to learn how the labor provisions of the Act can most wisely be given effect.

The book lays no claim to special knowledge of how the administration will interpret these provisions of the Act in detail. But it seems clear that the Act will encourage both directly and indirectly a considerable development of "company unions" and of collective bargaining dealings in the immediate future. The authors have drawn on their wide and varied experience in labor and personnel work to meet the demand for information about this newly created problem.

Chemical Economics, by Williams Haynes, 310 p., published by D. Van Nostrand Co., Inc., 250 4 ave., N. Y. City $3.25.

Chemical Economics will prove highly instructive alike to the chemical company executive, salesman, laboratory worker, consultant, engineer—in short to every person either making a livelihood or deriving a livelihood from chemical fields. Being a history of chemical industry from the economic or dollars and cents viewpoint, the book has widespread appeal. We refrain purposely from using the term-textbook. For some unaccountable reason the term usually implies dullness. One is taken in Chemical Economics on an exciting colorful journey, one full of mystery, romance, intrigue, outstanding success, and tragic failure. A novel, lavish, spectacular use of the photographer's art adds not a little to the "readability" of the book. Chemical Economics is not merely a recital of the happenings within the chemical industry in the past 100 years. Each step forward is skillfully interpreted and the economics involved are fully explained. We would not be at all surprised if the book proves to be a hand-book of information also to that large and growing group of Americans who are heavily investing in our chemical industry.

Business Under The Recovery Act, by Lawrence Valenstein and E. B. Weiss, 314 p., published by Whittlesey House, a division, McGraw-Hill Book Co., 330 W. 42 st., N. Y. City. $2.50.

In a book of this type who the authors are and their background is most important. Lawrence Valenstein of the Grey Advertising Agency, N. Y. City has had nearly 20 years experience in practical marketing problems; E. W. Weiss was for a number of years a member of *Printers' Ink* editorial staff.

This book concerns itself primarily with the effects of the National Industrial Recovery Act on the marketing phases of business. A product is made. It rests in the manufacturer's warehouse. How will its passage from that point, to the ultimate consumer's hands, be influenced by the Act? What business men want to know is: "How will this Act affect me—how will it affect my business?" Here are the answers to these questions—briefly, simply and clearly stated.

Tours Through The World of Science, by William T. Skilling, 758 p., published by McGraw-Hill Book Co., 330 W. 42 st., N. Y. City. $1.70.

A noteworthy attempt to bring the story of man's scientific achievements to boys and girls of high school age in an extremely fascinating manner. Of more than passing interest is the large number of well-chosen photographs that add immeasurably to the interest of the book. A well-balanced textbook that will appeal to teacher and student alike.

What Progress in Safety?

By Ira V. Kepner
Safety Director, Pennsylvania Salt Co., Menominee, Mich.

STATISTICS of any kind are generally dull—but like bad medicine that will help us—we must take our statistics and like it, *and* if we hope for future success in Accident Prevention work we must take seriously the up's and down's of our Frequency and Severity rates.

A careful review of the Accident experience in the chemical industry, covering the past six years, shows a very pronounced reduction in the frequency of disabling injuries, but a marked increase in the severity of the injuries since 1929.

During the year of 1930—211 Chemical Plants reported their accident experience to the Statistics Committee of the Council, during 1931—238 plants reported, and during 1932—266 plants reported. While the number of reporting units this year is the greatest in the history of the Chemical Section, the hours of exposure are somewhat lower than that of 1931, but the change in the accident experience of the industry from 1930 to 1932, inclusive, is more reliable than in earlier years, because it is based on the records of more companies than reported for any previous three year period. Constant reporting of your accident experience is good evidence of the value of comparing records annually, and increases the accuracy of our information.

Now for some medicine. Reporting chemical plants, during 1931, with a little more than 181 million man-hour exposure, had a frequency rate of 12.65. During 1932 with reporting companies having a 175 million man-hour exposure, the frequency rate was reduced to 10.53—14 per cent. below 1931, all of which was "good news," but during 1932 we had the worst experience of recent years in the severity of accidents. The severity rate for 1931 was 1.84 and for 1932 it was 1.92, an increase of 16 per cent. over the figure for 1931.

In the 238 chemical plants reporting for 1931 there occurred 2,300 time-loss injuries, of which 166 were serious, including 36 fatalities. In the 266 plants reporting for 1932 there occurred 1,842 time-loss injuries, of which 155 were serious, including 41 fatalities.

The pronounced increase in the number of fatalities accounts for the unfavorable 1932 severity rate, which is the same old alibi we have given for the past four years, until it has now reached the highest peak in six years, and for this we are gradually dropping in severity rank below many of the other industries. At one time the chemical industry was one of the big six in rank, in the severity of accidents, but in 1931 with 28 industries reporting the chemical industry had fallen to 14th in rank. In 1932 with 31 industries reporting we rank 22½, being a tie with the paper and pulp industry for the 22nd place in the sun. All of which leaves us wondering just what has caused this reversal of frequency and severity rates.

Since the chemical industry accident statistics for 1932 were published, I talked with many safety men regarding their opinion as to the cause of this continued increase in our severity rate. Each had a different theory as to how it all came about. Some believe the depression, which caused many workers to be laid off, and the workers retained, to be shifted from one job to the other, increased the inherent hazards in which the human element plays such an important part. Others are of the opinion discontent on the part of the workers over changed conditions, anxiety and mental disturbance caused by worry over the possible loss of employment, or an insufficient income, (due to wage cut or shorter working hours), to properly care for his family or to meet his pledged obligations, caused accidents which had something to do with it. Still others are of the opinion that some companies, in order to economize, made no appropriations for accident prevention necessities since the crash of 1929, and now, three years later, serious accidental injuries occur on the account of it. Others believe the severity increase is due to the fact that the chemical industry has had such rapid growth in

chemical engineering science, in the past few years, that the safety aspect has been unable to keep up with the pace, along with the lack of knowledge of the safety engineer of the new chemical lines on which to do safety work, thus increasing the frequency and severity of accidents. All of these causes may have had something to do with the increase in the severity of injuries these past few years; each of us have our own opinion. Without doubt worry has been the underlying cause of many serious injuries, but an analysis of most accident records will show thoughtlessness and carelessness are still the two big factors which cause accidental injuries, and I am sorry to state thoughtlessness on the part of one of the employees of the company I represent caused that employee the loss of his life; a two year no accident plant record to be broken, and an increase to the severity rate of the chemical industry for 1932.

But getting back to the medicine again. Our 1932 experience in the frequency and severity of accidents as shown in the National Safety Council Annual compilation of industrial injury experience has been published and discussed many times since being issued. You have probably noted it is similar to the records in several of the other industries. As an example the severity rate increased from 1931 to 1932 in the electric railway organizations, automobile plants, and the paper and pulp mills, whereas the frequency rate in these important industries declined. However, the accident records of the construction, rubber, clay products, printing and publishing industries show improvement in both frequency and severity rates.

Considering the records in the various branches of the chemical industry, manufacturers of carbon products had the lowest frequency rate, 2.86, and coal tar distillation plants had the lowest severity rate, 0.26. The average frequency rate was highest among manufacturers of fertilizers, 38.75, and the highest severity rate, 6.04, occurred among explosive manufacturers.

Still Much to be Accomplished

Considerable room for improvement in the frequency of accidents exists among coal tar distillers, manufacturers of salt, and plants producing vegetable oils. Severity rates were particularly high in dye plants, chlorine and alkali manufacturing establishments, and among the makers of industrial gases, pharmaceuticals and fine chemicals, and vegetable oils.

However, when we consider the possible hazards involved in the manufacturing of these various chemicals, including high explosives, where one little mistake or thoughtless act on the part of someone may cause an explosion or poisonous gas to be liberated, generally causing serious injuries to a number of persons, we may be glad the severity rate is no higher. Naturally, these high severity rates raise the average rate for the entire chemical industry, which is above the rate of the rubber, meat packing, glass and automobile plants, although the frequency rate for all chemical plants compares favorably with the rates in these industries.

It has been commonly held that as frequency rates of industrial concerns are reduced, improvement in severity rates will follow automatically, and to about the same degree, although a recent examination of accident records indicate this was only partly true in the chemical industry last year.

Three Classifications for Chemical Plants

During 1932 all reporting chemical plants were divided into three classifications. Those with the lowest frequency rates, a middle classification, and those with the highest rates. The group with the lowest frequency rate had a 71,185,000 man-hour exposure, had 213 injuries, 64,348 days lost, a frequency of 2.99 and a severity of .90. The next group with a middle frequency had a 58,640,000 man-hour exposure, had 558 injuries, 111,178 lost time days, a frequency of 9.61 and a severity rate of 1.91. The group with the highest frequency had a 45,659,000 man-hour exposure, 1071 injuries, 166,455 lost time days, a frequency of 23.46 and a severity rate of 3.51. The best plants have an average frequency rate of 2.99, 31 per cent. below the next group; they also have an average severity rate of 53 per cent. lower than the next best group. The frequency rate of the best plants is about one eighth that of the highest rate plants, whereas the severity rate of the best plants is about one-fourth the highest rate plants.

These results seem to indicate that to obtain a given reduction in severity a large reduction must be made in frequency. In other words, the plants that have succeeded in greatly reducing the number of their injuries have also reduced the time loss from accidents, but not to so great a degree. Prevention efforts have been more successful against minor accidents than the major ones. However, the wide differences in individual rates in the various chemical groups show opportunities for better safety records.

During the year of 1932 large plants had the best frequency records, but the small plants excelled in the severity records, as follows: large plants frequency, 11.36, severity 2.19. Small plants, frequency 16.66, severity 1.30. The difference in rates of large and small plants is especially marked in some branches of the industry. Small acid plants, for example, averaged 12.77 in frequency and 2.84 in severity, against 4.94 in frequency and 1.13 in severity in large plants. It would be interesting for the reporting companies to compare their 1932 frequency and severity rates with the average for their sized group, and in addition with the average for their entire classification.

If in going over your accident records you find your frequency and severity rates show a tendency to increase or indicate no progress during the past

few years, a thorough investigation of plant hazards should certainly be made. This is especially true at this time since the NRA is in force and new conditions prevail, with the Federal Government assuming a new relationship with the industries, maintaining jurisdiction over hours of labor, wages, volume of production, prices, etc. It is quite probable safe working conditions will also receive some consideration, and plants which have been wholly or partly idle for months will need very careful inspection to eliminate accident hazards before starting up. Old safeguards, goggles, gas masks, protective clothing, etc., must be carefully inspected and condemned if found to be in any way defective, and if special care is not taken it will become more and more difficult to maintain a good frequency and severity record or improve a poor one.

Chemical Industry's Place

The chemical industry ranks as one of the highest in occupational hazards, but when we look over the analysis of the causes of accidents in our industry, as they are presented to the various State Departments of Labor and Industry, we find during a one-year period the reports to the Industrial Commissions of the States of Illinois, New York, New Jersey, Pennsylvania and Maryland combined show 3,022 injuries occurred in the chemical industry from the following causes: 792 from handling objects, 409 from harmful substances, 340 about machinery, 311 falls from different levels, 245 falls from the same level, 214 from electricity, explosives and heat, 118 from vehicles, 142 using hand tools, 135 from stepping on or striking objects, 129 falling objects, and 124 from other causes. Injuries such as these occur in almost every industry and make us wonder just how many of these 3,022 injuries were actually due to the manufacturing or handling of chemicals. It is to be regretted that companies reporting injury rates do not supply information as to the cause of the accident producing the injury. Most companies have this information for their own files, using it to good advantage to eliminate the possibility of a repetition of a second injury from the same cause.

As to the question, "Is the chemical industry making progress in accident prevention work?" my answer is yes, remarkable success, if spread over the past eight or ten years. In 1923 the frequency rate in the chemical industry was 24.55 per million hours worked, which has been reduced to 10.52 per million man-hours worked in 1932. The severity rate in 1923 was 4.78 which was reduced to 1.92 in 1932. Results such as these cannot be contradicted. To me the increase in the severity rates for the past four years would indicate during the years of 1930-31 and '32 many safety organizations had been reduced to skeleton form, and in many companies such organizations had been sadly neglected or entirely abandoned. If frequency and severity rates are to be reduced there is only one way to do it and that is by adequate and correct supervision of safety, for just as surely as safety supervision is neglected, frequency and severity of accidents will increase.

Probably you are wondering how the concern I represent has made out during these "hectic years," so just to oblige I'll give you our "honest" record for the last six years.

1926.....	Frequency	14.61	Severity	2.66
1927.....	"	16.94	"	.802
1928.....	"	13.32	"	2.79
1929.....	"	24.26	"	1.74
1931.....	"	14.49	"	.350
1932.....	"	14.96	"	3.25

Our 1932 record just goes to show what one fatality did to a fairly good severity record, and I am not proud of this record at all.

Certain companies that made the best 1932 records in their group or the largest improvement since 1930 permitted the use of their names. This list was printed in the June issue of CHEMICAL MARKETS.

Disabling Injuries, 1932, Chemical Industry, by Industrial Groups.

INDUSTRIAL GROUP	No. of Industrial Units	Man-Hours Worked (Thousands)	Average Number of Employees	NO. DISABLING INJURIES				NUMBER OF DAYS LOST				INJURY RATES	
				Death & Perm. Total	Perm. Partial	Temporary	TOTAL	Death & Perm. Total	Perm. Partial	Temporary	TOTAL	Frequency	Severity
ALL GROUPS	266	174,908	74,460	41	114	1,687	1,842	246,000	61,357	28,624	335,981	10.53	1.92
Carbon Products	10	5,225	2,604	0	2	12	14	0	2,250	162	2,412	2.68	.46
Industrial Gases	12	2,045	854	1	0	7	8	6,000	0	259	6,259	3.91	3.06
Acid Manufacturing	15	16,995	5,043	3	15	66	84	18,000	3,854	1,310	23,164	4.94	1.36
Dye Manufacturing	7	9,877	4,263	6	7	64	77	36,000	3,045	1,334	40,379	7.80	4.09
Paint and Varnish Manufacturing	27	22,142	10,167	1	4	186	191	6,000	1,650	3,553	11,203	8.63	.51
Explosives Manufacturing	25	13,307	6,353	13	2	125	140	78,000	360	2,060	80,420	10.52	6.04
Chlorine and Alkali Manufacturing	8	5,256	2,201	2	3	52	57	12,000	1,460	1,550	15,010	10.84	2.86
Pharmaceutical and Fine Chemical Manufacturing	19	10,207	4,530	4	6	148	158	24,000	2,444	1,183	27,627	15.48	2.71
Soap Manufacturing	19	23,072	9,845	4	28	346	378	24,000	13,570	5,028	42,598	16.38	1.85
Vegetable Oil Manufacturing	24	4,636	1,644	0	7	98	105	0	10,688	1,437	12,125	22.65	2.61
Coal Tar Distillers	14	1,197	452	0	0	29	29	0	0	307	307	24.23	.26
Salt Manufacturing	11	3,928	1,541	0	4	128	132	0	3,100	1,952	5,052	33.60	1.29
Fertilizer Manufacturing	8	1,187	467	0	0	46	46	0	0	1,420	1,420	38.75	1.20
Not Otherwise Classified	67	55,834	24,396	7	36	381	424	42,000	18,936	7,069	68,005	7.59	1.22

Safety in Synthetic Ammonia Plants

By E. C. Curtis

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THE more than ordinarily hazardous potentialities of commercial scale high pressure operations have made considerations of safety paramount in the minds of both designing engineers and operating staffs. Search for better materials of construction and methods of operation has been intensive. There is no better evidence of the success of these efforts than the relatively few serious accidents in plants of this character.

The first high pressure operation was synthetic ammonia production. The success of this method led almost at once to its application to methanol production. The familiarity with high pressure technique gained by experience with these processes contributed substantially to recent advances in petroleum and coal hydrogenation.

A process utilizing large quantities of hydrogen and nitrogen at pressures ranging from fifteen hundred to fifteen thousand pounds and at temperatures from 30° C. below zero to over 600° C. requires very little engineering imagination to appreciate its hazardous possibilities. The failure of equipment by rupture at high pressure is likely to take place with explosive violence and the liberated hydrogen mixed with air is practically certain to be ignited by electrical equipment or otherwise. It is highly important then, to prevent rupture of piping and equipment. It was noted during experimental work in the development of the process that most of the ordinary steels used underwent a very pronounced deterioration of their physical properties in contact with hydrogen-nitrogen-ammonia mixtures at high pressures and temperatures. These observations made it possible to design and operate the earlier commercial plants with a reasonable degree of assurance that they were safe for a limited period. Frequent inspection and replacement as well as liberal safety factors carried the industry through the period during which materials more resistant to the specific conditions were developed and tested.

The rate of reaction of the gaseous mixtures with steels is very much influenced by the temperature, ammonia content, and the composition and physical condition of the steel. The effects are of three sorts, decarburization, nitriding and fissuring.

Decarburization, nitriding, and fissuring alter the physical character of the steel for the worse. The first decreases strength, the second increases strength but decreases ductility, while the third results in a loss of both strength and ductility. The net result is inability to sustain bending stress or suddenly applied loads—a condition approaching brittleness in extreme cases. Steels now obtainable resist ammonia synthesis conditions very much better than those available ten years or more ago.

The transportation of hydrogen in low pressure pipe lines and its storage give rise to special hazards which should be noted. Hydrogen-air mixtures are explosive between four per cent. hydrogen and 75 per cent. hydrogen roughly. Wherever a flammable gas is handled there is always a possibility of admixture with air in pipe lines or holders. The obvious way to prevent trouble is to avoid explosive mixtures, to which end we employ on our hydrogen lines air alarms operated by thermal conductivity to warn us that air is being admixed with the hydrogen. A red light and a gong give visual and audible warning before the percentage of air gets anywhere near the danger point. Fortunately about twenty-five per cent. of air must be present before the mixture becomes explosive.

When hydrogen containing lines or equipment are worked on, certain precautions must be taken before the work starts. It is insufficient to close a valve or insert a blank somewhere in the line. It must be completely disconnected from the source of hydrogen

and then flushed out with some inert gas such as nitrogen. It is equally important that the line or equipment be carefully inspected before turning in the hydrogen to be sure that it has been properly "buttoned up." The necessity for these precautions seems so obvious that one would think it unnecessary to mention them, yet accidents have occurred because of failure to observe them.

Explosion arresters in the form of metal gauze installed in pipe lines are rather extensively used at

Cooperation can be developed by the constant display of posters

our plant. For small pipes, two inches in diameter or less, single or double flat screens are used. For the larger pipe sizes double cone screens of 40 mesh gauze are used. The long axis of the cone is twice the pipe diameter and the apex of the cone is pointed toward the probable source of ignition. The cones are crimped and laced with wire, not soldered.

The original data for these screens were obtained from Report No. 528 by the Underwriters Laboratories. From these data we built and tested a number of screens on hydrogen-air mixtures. The apparatus used for the large screens consisted of two sections of eight inch pipe flanged on both ends, one piece three feet long, the other six feet long. The flanges of adjacent ends held in place a double cone screen of 40 mesh brass gauze. The opposite flanged ends of the pipe were closed with one-sixteenth inch thick red rubber sheet packing. The hydrogen-air mixtures were ignited by means of a spark plug. Explosions began at about 27 per cent. air in hydrogen and were arrested up to 48.5 per cent. air in hydrogen. The very heavy explosions in mixtures with a higher percentage of air were not arrested.

Relief valves for high pressures which will open at constant pressure and reseat repeatedly without leakage present some special design problems. To illustrate, the usual type of bevel seat valve designed to blow at 4600 lbs. and to pass the full capacity of one of our compressors will have a seat with a one-fourth inch small diameter, five-sixteenths inch large diameter and a 45° level. When the valve is newly ground and tested the pressure may be sealed close to either the five-sixteenths inch or the one-fourth inch diameter. Subsequent blowing of the valve may wear the seat so that the seal is at a different diameter. The quantity of oil on the seat may also change the sealing point. Calculation of the area exposed to pressure when the seal is at different points will show that the total load tending to open the valve may vary several hundred pounds in the 4500 lb. range. The foregoing is merely our theoretical explanation of observed irregularities in the operation of this type of valve.

With any type of relief valve it is advisable to filter the gas which passes through it for the removal of oil and particles of pipe scale.

Probably the most important application of safety valves is for low pressure equipment which must be in direct connection through piping with high pressure equipment. Such a situation is practically unavoidable where there is a continuous production of liquid ammonia at several hundred atmospheres pressure which must be drawn off continuously into low pressure storage tanks built for working pressures up to 300 lbs. Our storage tanks are normally operated at less than 225 lbs. pressure. The tanks are protected by two standard three inch ammonia spring type relief valves set to blow at 300 lbs. These large valves are designed to relieve pressure fast enough to protect the tank under all conceivable conditions. As warning reliefs we have on each tank a one-half inch spring type valve and one of the frangible disc reliefs previously described. Both of these are set to blow at 260 lbs. Operation of the small valves gives warning that something is wrong and allows sufficient time to correct the trouble before the three inch valves blow at 300 lbs.

Stress Laid on Regular Inspection

Unless regularly inspected and tested at regular intervals, safety valves are worse than useless. They give a false feeling of security and safety. At our plant we list all these valves on cards. When tests are made the entry is made on the card which is filed under a tickler system. About one minute with this file tells the supervisor whether all tests due in any month were made.

A somewhat similar system takes care of any hydrostatic tests which must be made on equipment. Such tests are made according to the usual standard of one and one-half times the working pressure, although in many cases we go to three times the working pressure depending mainly on whether the equipment operates at normal temperatures or at high temperatures. Pieces under test are always

carefully sand-bagged for protection in case of rupture.

Pipe lines which carry anhydrous ammonia are hazardous to open because of the possibility of liquid ammonia being trapped in pockets. Pressure may be bled off these lines but even so they should be opened cautiously and only by workmen equipped with goggles or, better, a face mask which covers the face completely. Constant supervision is required to ensure observance of this rule but sooner or later it will pay by saving an eye.

Aqua ammonia tanks must carry both pressure and vacuum relief valves. Tanks just emptied of aqua ammonia but full of ammonia gas are quickly collapsed when water or weak aqua is pumped into them. A vacuum is created by rapid solution of the gas. Vacuum reliefs must be of ample capacity. I have seen at least one tank collapse even though it had a vacuum relief, because the valve opening was too small.

Production of aqua ammonia directly from synthetic anhydrous ammonia has another hazard which must be guarded against. The high pressure at which the anhydrous is produced causes a considerable volume of hydrogen to go into solution in the liquid ammonia. Most of this passes out of solution in the anhydrous storage tanks where the pressure is 200 lbs. or less. Some, however, remains in solution and is released when the anhydrous is dissolved in water. Dangerous mixtures of hydrogen, air and ammonia gas may result unless precautions are taken.

Corrosion by Cooling Water

Corrosion of equipment by cooling water gives rise to dangers which are not necessarily peculiar to high pressure operations but which are rendered more acute by the pressures used. The water of the Niagara River is quite corrosive. Compressor intercoolers, for instance, are quite rapidly attacked. Continual cleaning and renewal of tubes is necessary to prevent leaks of flammable hydrogen gas. Danger of igniting the gas is the principle hazard here because leaks due to corrosion do not usually show up as a violent rupture.

Compressors have cast iron cooling jackets around the cylinders. Leakage of high pressure gas may rarely take place into these jackets rapidly enough to build up a bursting pressure. This is guarded against by using sheet rubber explosion discs, one on each side of the cylinder. This gas leakage might be too slow to burst the discs but sufficient to produce dangerous gas mixtures in the sewer. To avoid this the discharge from these jackets is into a funnel easily observable by the operator. Examination of the discharge stream shows whether there is gas leakage or not.

Electrical equipment is an ever present source of ignition of flammable gases. The best maintenance possible does very little to mitigate this hazard. The only sure way to prevent disaster is to prevent leaks and this means constant inspection and thinking ahead to possible occurrences with a view to heading them off.

One other hazard more or less peculiar to high pressure plants: the tube of Bourdon Tube type gauges sometimes bursts. Most of these gauges have a blow-out disc in the back but with high pressures this is not very good insurance that the glass will not be blown into the face of an observer. A shield of heavy wired glass may be used in front of the gauge or, if this is not convenient, then Celluloid may be substituted for the glass in the gauge. A shut-off valve should be provided at some distance from the gauge so that the gas flow can be shut off if the tube bursts. I have seen a gauge produce a pin-wheel of flame six feet in diameter when it burst and the gas became ignited by an electric bulb which was shattered by the bursting gauge.

The most complete system of safeguards, alarms and automatic equipment may be installed in a plant but accidents will happen frequently unless there is a studied effort on the part of the supervision to develop a training system for operators that will ensure only thoughtful action. Nowhere is this more true than in high pressure plants. Most of the accidents and near accidents that I have seen in ammonia plants happened because someone acted thoughtlessly, that is, without first trying to forsee the consequences of his action. Some situations require speedy and automatic action with no time for thought, but in nearly all cases of this kind the situation can be forseen by the supervision, and the necessary reaction so thoroughly taught to the men that they do the right things. If there are any secrets about how to prevent accidents in any industry that is surely one of the most important.

Lac Research

Recent bulletin issued in India reports research has unearthed interesting details of the retarding effect which pressure has on the time of heating required to cure shellac. A rough classification of substances causing variation in the time of curing has also been attempted. Alkalies and solvents possess retarding influences, while accelators include acids, ester-forming catalysts, and ammonia and ammonia liberating substances. Research on wax-free shellac points out that in some industries wax is undesirable and is filtered on before use, while others, *i. e.* the gramophone record industry, insist on the presence of a certain amount of wax. Comparison of the properties of varnishes prepared from shellac, with and without filtration of wax, was made. The wax-free film was clearer and more attractive in appearance, less hygroscopic than ordinary shellac, and had as much resistance to ordinary wear and weathering. However, it lacked mechanical strength, chiefly elasticity, which implied that the function of the wax present in shellac is that of a fairly good plasticizer. These facts would serve to support the fact that a wax-free film or one with a low percentage of wax is preferable wherever backing is practicable, *i. e.* in the electrical industry. The concluding suggestion is that in cases where the advantages of a wax-free shellac are wanted but baking is impractical, it may be possible to substitute suitable plasticizers for the natural wax.

Stainless Steel Equipment

Inspection and Repair

By C. E. Plummer
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IN ORDER to select intelligently a stainless steel for a particular application, a knowledge of the most commonly used stainless steels and their properties is essential. Because of similar characteristics, the stainless steels may be divided into three groups —martensitic, ferritic, and austenitic. Stainless steel specimens from each of these groups can be used as indicators to determine the proper material for the equipment under consideration. These indicators should be tested under actual operating conditions, because such conditions cannot always be duplicated in laboratory tests.

Group I—Martensitic Steels

These steels are composed principally of chromium, iron, and carbon. They air harden intensely, are magnetic, and are subject to heat treatment like carbon steels. Typical compositions are four to six per cent. chromium, and 12 to 15 per cent. chromium, both with low carbon.

Type—Four to Six Per Cent. Chromium, Low Carbon: alloy, extensively used in the oil industry, may be obtained in plates, sheets, squares, octagons, flats, strips, tubes, wire, forgings, blanks, castings, ingots, etc. In the fully annealed condition this steel is stronger than soft steel with same carbon content. Addition of one-half per cent. molybdenum or one per cent. tungsten gives a stronger steel at elevated temperatures.

Type—12 to 15 Per Cent. Chromium, Low Carbon: steel is stronger than soft steel, takes a good polish, and in this condition resists atmospheric corrosion indefinitely; it is not apparently affected by fruit juices, and resists oxidation at high temperatures up to 1400° F. It is a fair stainless steel where good strength, toughness, and high impact value are required. To obtain the best properties this steel should be heat treated. Like the four to six per cent. chromium steel, it air hardens. Applications are golf-club heads, valve parts, automobile parts, etc.

Group II—Ferritic Steels

These steels, composed of chromium and iron, with the chromium in excess of 18 per cent. are non-hardening, and in the annealed condition relatively strong and ductile. Typical compositions are 18 to 23 per cent. chromium, and 26 to 30 per cent. chromium.

Type—18 to 23 Per Cent. Chromium, Low Carbon:—combines case of fabrication with better corrosion-resistant properties than the 12 to 15 per cent. chromium steel. Chromium steels with chromium content higher than 18 per cent. will not air harden, provided the carbon is low. This analysis finds application in nitric acid equipment, condensers and evaporators, fans and blowers, and plays an important part in chemical plant equipment.

Type—26 to 30 Per Cent. Chromium, Low Carbon:—shows remarkable resistance to many corrosive influences, including nitric acid and acid mine waters. Because of its resistance to oxidation at temperatures up to 2000° F., it finds application in furnace parts, supports, rabbel arms on roasting furnaces, etc., when brittleness is not a factor.

At elevated temperatures the higher chromium steels are susceptible to grain growth, which cannot be prevented or corrected by heat treatment. When these steels are heated for a long period of time at about 800° to 1000° F. and slowly cooled, they become very brittle when cold. This brittleness is only partly relieved when the metal is again re-heated.

The steels containing 16 to 30 per cent. chromium show considerable weakness if a notch or a change in dimension is present, and this should be taken into consideration where bolts are used. The chromium alloys are used at elevated temperatures, where sulfur is present in large amounts. The addition of two per cent. nickel gives a steel that is not so brittle when cold.

Group III—Austenitic Steels

Nickel is added to the chromium-iron alloys to produce a steel of a suitable austenitic type, possessing toughness, ductility, non-hardening properties by heat treatment, and high resistance to impact. The nickel also increases resistance to scaling at high temperatures, reduces grain growth, and at the same time lessens embrittlement after long service. These steels are non-magnetic. Like other alloys, proper processing is necessary in order to put the metal in its best corrosion-resistant condition. In contrast to ordinary iron and steel, these austenitic steels are softened by cooling quickly from above their critical range. Four characteristic chromium-nickel steels have been chosen for discussion.

Type—18 Per Cent. Chromium, Eight Per Cent. Nickel:—since this analysis takes a high polish, will resist indefinitely the attack of atmospheric air or of weak organic acids, it is used extensively in equipment for food manufacturing and processing, creameries, fruit and vegetable canneries, meat packing plants, refrigerator linings and trims, soda fountains and counters, chemical plant equipment, etc. As brought out later, the 18 per cent. chromium, eight per cent. nickel steel is easily fabricated, provided proper precautions are taken.

Inter-Crystalline Corrosion

Much has been written concerning the failure of welded stainless, due to inter-crystalline corrosion. When this alloy is heated in the range of 800 to 1500° F., carbides are precipitated, which, probably due to an electric potential difference, results in corrosion at the grain boundaries. Elements, such as columbium, titanium, vanadium, and molybdenum, have been added in an attempt to prevent inter-crystalline corrosion. It is beyond the scope of this paper to go into a theoretical discussion of inter-crystalline corrosion. Welds should be heat treated to put the metal in its best condition for resistance to corrosion.

There are many applications where heat treatment after welding and the use of modified analyses are not necessary, but, where corrosive conditions are severe, heat treatment after welding is absolutely essential. Many failures have been observed in the paper pulp industry, due to corrosion by sulfite liquors, where there was no heat treatment after welding.

Type—24 Per Cent. Chromium, 12 Per Cent. Nickel:—this steel is used for its strength value and oxidation-resistance at elevated temperatures. Because of its higher chromium content, it is more resistant to sulfur atmospheres at high temperatures than an alloy containing 15 per cent. chromium and 35 per cent. nickel.

Type—21 Per Cent. Chromium, 22 Per Cent. Nickel:—this analysis combines strength at 1500 to 1600° F. with excellent resistance to oxidation.

Type—15 Per Cent. Chromium, 35 Per Cent. Nickel:—since this steel can only be forged or rolled with considerable difficulty, it is used mostly in the cast condition, where both high strength and corrosion-resistance at elevated temperatures are desired. This steel is not recommended for use at elevated temperatures in the presence of sulfur, since the lower chromium and higher nickel result in breakdown, due to attack of the sulfur at the grain boundaries.

Although many alloys come under the classification of corrosion and heat-resistant alloys, this paper has been limited to stainless steels where the iron content is approximately 50 per cent. or more. The heat-resistant alloy is a field by itself.

Need for Right Information

Many times the steel manufacturer's request for information as to the use of stainless steel is misunderstood. However, it is to the mutual benefit of all, but particularly to the user, that the steel manufacturer be apprised of the use to which the material is to be put, so that he can intelligently follow its course with the ultimate use in mind.

By raw materials are meant plates, strips, forgings, castings, or other shapes from which are fabricated equipment or structures of some sort. Inspection of such material follows the same principles, for the most part, that apply to the inspection of ordinary carbon steel. However, due to its greater cost, the extreme care with which the material must be produced, and the importance of the effect produced by the various alloying elements, as well as the treatment in shaping, inspection must of necessity be correspondingly more diligently and intelligently applied than would be required for ordinary steel.

The chemical composition is of the utmost importance, if the desired properties for a particular service are to be attained. Therefore, check analyses are advisable, in order that the inspector and the buyer may both be satisfied that the alloying elements are present in the specified amounts and that in general the material conforms to the specifications. Particular attention should be paid to the chromium content, the nickel content, or that of any other alloying element desired, while at the same time the carbon and sulfur content should be watched, so that they do not exceed prescribed definite limits. That the proper alloying elements be present in definite quantities, and that deleterious elements be excluded or confined to definite limits is, of course, a basic consideration to the maker, the buyer, and his agent—the inspector.

Because the effect of too high or too low a temperature would more than likely prove detrimental to the ultimate efficient and safe use of any equipment, it is essential, after the rolling or working of the alloy into the proper shape, that the heat treatment of such shapes be carefully conducted. The only means to determine whether or not proper heat treatment has been given is for the inspector actually to witness this

operation and check both the time and the temperature specified and used. Actual witnessing of such treatment should also be supplemented by corrosion tests on test pieces, thus making sure that the proper treatment has been given and adequate results obtained.

As in ordinary steel, the finished material in the shape of bars, plates, etc. should be thoroughly checked for surface defects, such as laminations, seams, cracks, blisters, blow holes, pipes, etc. Since the making of alloy steel is a more delicate operation than that of ordinary steel, the chances of mishaps and consequent defects are also greater.

Finally, if there is to be a further finishing operation, involving the use of heat, such as in the manufacture of rivets, this too should be witnessed by the inspector, in order to gain assurance that the proper temperatures are maintained.

The inspector cannot know too much about each process involved or the part that each will ultimately play in the safety, performance, and efficiency of the piece of equipment or structure for which it is intended.

Fabrication

Fabrication of the raw material, be it into tanks, pressure vessels, pumps, centrifugal machines, or soda fountains, is likewise a process susceptible to inspection as a means of guaranteeing safe and satisfactory performance.

The range of products, into which the raw materials may be fabricated, is vast and, since the particular method of inspection in each case must vary in its details, no attempt will be made to set forth each condition that should be taken into account for each particular piece of equipment.

If the stainless steel is to be fabricated into tanks or other equipment of similar nature, requiring fitting of parts and their subsequent riveting or welding, then it will be the inspector's duty to check the laying out of the component parts, in order to make sure they fit absolutely, that edges are planed and not bevel-sheared, that rivet holes (if such be necessary) are sub-drilled and reamed, rather than punched.

If the equipment is to be welded, additional precautions are necessary. Corrosion or embrittlement must be guarded against, and in addition the type or class of parent metal will be an important factor in the particular method used. There are various methods used today in welding, such as the metallic arc, carbon arc, resistance, seam or butt, spot, line, atomic hydrogen, alternating current arc, or oxy-acetylene. If the metallic arc welding method is used, reverse polarity is recommended, the work being the negative and the welding rod the positive. Before welding, the inspector should be sure that the parts to be welded are clean, since grease may cause pits or hard spots. The selection of the welding rod is very important; coated rods are recommended for metallic arc welding, and uncoated for oxy-acetylene welding. The gauge of the material influences the method used. For economic reasons one method may have an advantage over another. There are so many influencing factors that the selection of the welding method should be left to the advice of an expert on the welding of stainless steels. It is axiomatic, of course, that before any welding is done at all the inspector will want to make sure the fabricator can produce satisfactory welding work. It is imperative that every precaution be taken in regard to welding and this extends to the metal used, as well as the methods employed.

As a check on welding, the X-ray is recommended as being an ideal method of non-destructive inspection of the finished welded product, and particularly is this desirable where pressures or stresses are to be resisted, or where corrosive substances are to be encountered.

After welding, annealing is generally required to remove embrittlement and prevent corrosion at or near the weld—both of which would weaken the equipment and lead ultimately to its destruction. The proper temperature for such annealing is necessary, and it is consequently the inspector's duty to see that these temperatures are attained and maintained. Thus, austenitic steels will require a temperature of 1850° F. to 2000° F., the four to six per cent. chromium steels 1550°F. to 1600° F., the 12 to 15 per cent. chromium steels 1450 °F. to 1500° F. Since the 24 to 30 per cent. chromium steels are non-hardening, annealing after the welding operation is not required. The atmosphere should be slightly reducing. The rate of cooling, too, differs; in the austenitic groups rapid cooling is desirable, while in the chromium-iron alloys the temperature should be slowly lowered at a rate not exceeding 50° F. per hour.

Of course, there are many other operations, which are more or less basic to any fabrication process, that require the attention of the inspector.

Shearing, Blanking and Punching

The shearing of austenitic alloys differs from ordinary steel in that more power must be used, and the material must be cut completely through. The principal consideration in this operation is to guard against work-hardening of the metal, which effect may be deleterious to its use and certainly increases the fabrication cost of production.

Also, in blanking and punching of austenitic alloys, more power must be used than is required for mild steel, while at the same time a necessary precaution is to keep a neat clearance between the punch and the die. Too great a clearance will cause the material to work-harden.

Machining of austenitic steels is best accomplished at a speed of about one-half that used for mild steel. A tool with design similar to that used in machining dead soft brass is recommended. Austenitic steels have been successfully machined in automatic machines, when they have a Brinell hardness between 200 and 240.

Forming and drawing requires heavier lubricant, slower press speeds, and greater clearances between punch and die than in mild steel.

Drilling, as mentioned, should be done by a high speed tool adequately backed up.

Sawing requires high speed hack-saw blades with a wavy tooth.

The types four to six per cent. chromium and 13 to 15 per cent. chromium have been found to machine better when they have a Brinell hardness of approximately 220. Slightly slower speeds are recommended. In machining types 15 to 18 per cent. chromium and 24 to 30 per cent. chromium, a tool with design similar to that used on semi-hard brass is recommended. When used on automatic screw machines, manufacturers can furnish special free-machining grades.

Austenitic, martensitic and ferritic steels may be cold or hot riveted. If hot riveted, the temperature of such rivets should be 1900° to 2100° F. for austenitic (finishing above 1600° F.); martensitic steels 1450° or less; ferritic 1500° F. The temperature of the rivet furnaces should be thermostatically controlled, and for this purpose electric furnaces are preferable.

Brazing is not recommended for any of these types of steel, (its tendency being to decrease corrosion-resistance).

The stainless steels can be soldered, provided the metal is properly treated. Uncut muriatic acid is recommended as a flux; because of lower thermal conductivity, a larger iron is needed, while at the same time care should be taken not to have the solder too hot as embrittlement may be the consequence. To prevent buckling, chill plates may be used and with the austenitic group these should be of copper. Another precaution is, after the soldering is completed, to inhibit further action by washing thoroughly with ammonia water.

This review of the fabricating processes has been rudimentary, and intended only as a broad sketch of the various conditions, under which alloy steel equipment is turned out, and the precautions necessary to observe in order not to destroy the intrinsic properties and qualities of these rather new materials. Rightly fabricated and intelligently used, they are safe and extremely satisfactory—but, if the rules are not observed in either the fabrication or use, a dangerous situation will exist, in that the equipment will be called upon for functions for which it is no longer fitted, and, as a consequence, the safety factor of such equipment is unknowingly exceeded, and perhaps the lives of men endangered thereby.

A few of the most common causes of failures of stainless steel equipment are as follows:

Improper selection of stainless steel.
Improper inspection during fabrication.
Failure to heat treat after welding.
The selection of too thin a gauge of material.
Galvanic action resulting from dissimilar metals in contact in an electrolyte.
Mechanical failures.

American Turpentine vs. Japanese Camphor

By O. T. McIntosh
President Carolina Land Co.

THE naval stores industry has passed through several major crises during the last quarter century, and future prospects are none too promising, notwithstanding the fact that the government has recognized that the industry is entitled to help under the Agricultural Adjustment Act. The critical situation may perhaps be better appreciated when it is realized that net returns to naval stores producers have shrunk to the most unprofitable level in thirty years, and as a result, the financial position of the industry is such that its very existence is threatened.

Since it is estimated that between 20,000 and 35,000 families are directly affected by this condition, it will be seen that if we are to participate in the recovery program every field should be searched for means to improve the position of the industry. The best way to accomplish this is, of course, to increase consumption; the rest will follow naturally.

In this connection, the manufacture of synthetic camphor, in which turpentine is the essential raw material, should be of great interest to the producer of naval stores. Then, too, the American producer has a particularly large stake in this product as American turpentine has been found to be best suited for its manufacture. It has been reliably estimated that over 90 per cent. of the synthetic camphor produced is made from American turpentine.

Growth of Synthetic Camphor

The commercial manufacture of synthetic camphor goes back to the beginning of the twentieth century, and has increased steadily with the growth of the pyroxylin industry in which over 2/3 of the total world production of camphor is used. The two products natural and synthetic, are used interchangeably not only in the making of Celluloid and like products, but also in disinfectants and explosives. In this country, only natural camphor has as yet been used medicinally. However, this represents only 10 per cent. of our total camphor consumption, so it can truthfully be said that the synthetic product is a formidable rival for natural camphor. It is, therefore, understandable that the producers of the latter have

been constantly trying to make things difficult for the synthetic camphor industry.

The natural compound is produced by distillation from the camphor tree which is indigenous to the Island of Formosa, a Japanese possession, and the production and refining of camphor have been operated as a monopoly of the Japanese government since 1899. Attempts to grow camphor trees elsewhere for commercial purposes have all ended in failure, owing chiefly to the fact that nearly fifty years are required to produce a tree of profitable yield.

At the present time, Germany is by far the largest producer of synthetic camphor; small quantities only are produced in France, Italy, Spain. In the United States, several attempts have been made to build up a synthetic camphor industry. These efforts apparently have not met with great success, owing in part to the necessity of finding a profitable use for certain by-products; and at the present time we are informed there is only one producer of synthetic camphor, notwithstanding the fact that the Tariff Act of 1930 provides for a duty of 5 cents per pound on synthetic camphor, compared to 1 cent per pound on crude natural camphor.

Most Important Factors

From a naval stores producer's point of view the important factors are:

(1) Synthetic and natural camphor are industrially interchangeable, so that the net protection to the American manufacturer is really only 1 cent per pound.

(2) 4 cents differential in duty between crude natural camphor and synthetic camphor.

(3) It takes about 2 lbs. of turpentine to produce 1 lb. of synthetic camphor; thus from a gallon of turpentine, weighing approximately 7 lbs., about 3½ lbs. of synthetic camphor can be made, which, multiplied by the 4 cents differential, imposes a penalty of 14c per gallon on the turpentine used in the manufacture of the synthetic product.

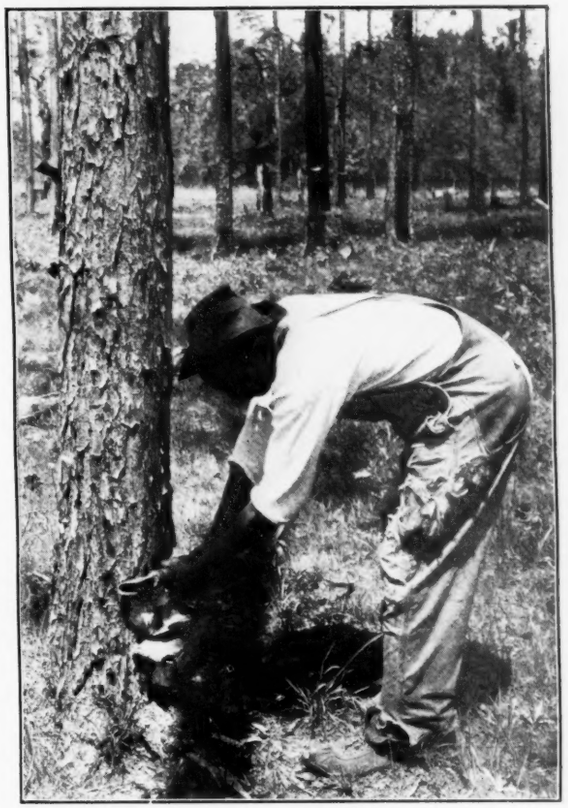
As may readily be seen from the following tabulation, the percentage of synthetic camphor imports to the total camphor imports has severely declined since the passage of the Tariff Act of 1930 and is now 12 per cent. compared to 41 per cent. in 1929.

Importations of Camphor into The United States
(in pounds)

Year	*Synthetic*	*Natural*	*Total*	*% Synthetic*
1926	2,944,478	3,188,750	6,133,228	47.7
1927	2,933,784	3,170,565	6,104,349	48.0
1928	2,264,916	5,540,708	7,805,624	29.0
1929	3,957,282	5,635,235	9,592,515	41.3
1930	2,393,691	2,089,977	4,483,668	53.5
1931	1,828,091	3,125,672	4,953,763	36.8
1932	1,459,674	2,833,260	4,292,954	34.0
1933*	267,506	1,941,895	2,209,401	12.1

*Up to and including July 1933.

Practically the entire decline in the percentage of synthetic camphor imported has been suffered by the German synthetic producers, who use almost exclusively American turpentine as raw material. Their loss is felt directly by our naval stores industry for, obviously, when their market is reduced, they make less camphor and, therefore, import less turpentine.



Turpentine "chipper" at work

Should these camphor producers be forced out of the American market, which has been their largest outlet, they might be compelled further to curtail their output. Then there would be still less turpentine used in the making of synthetic camphor, and our naval stores industry would lose a good market.

Loss Through Tariff

We might calculate the actual and potential loss occasioned by the tariff to the American turpentine producer as follows:

It has been estimated that total importation of camphor this year will be about 4,500,000 pounds; if this were all synthetic camphor, about 25,000 barrels of turpentine would be required. But these 4,500,000 lbs. represent less than 1/3 the normal world's consumption of synthetic camphor. So that we may say that in good times, about 75,000 barrels of American turpentine would be used in the making of camphor. This amount would be about 12 to 15 per cent. of the last few years' average annual production of turpentine.

Taking it from the point of view of employment: Between 1,500 to 2,000 men would be needed to produce 25,000 barrels of turpentine, but since only 1/9 of that amount will be imported, the number of workmen is reduced accordingly.

Thus, indirectly the Tariff is operating to the detriment of American naval stores producers and American workmen.

Selling Chemical Specialties

By Logan D. Grupelli
Mgr. Technical Sales Dept., National Oil Products Co.

IF WE look up the word "specialty" in the dictionary we find it defined as "a manufactured product of peculiar character." But this is only half the story.

Every time Barnum circled the old globe seeking a freak, he was in reality seeking a specialty. Barnum being an adventurous soul found impish delight in ferreting out freaks just out of curiosity, but he certainly would not have gone to the trouble and expense of bringing these freaks back to America just because they were freaks with peculiar characteristics. That's only half the story.

The other half is that he found a use for these peculiar people. He discovered that they afforded the American people with entertainment and that the American public will pay well to be entertained. Mr. Barnum became a manufacturer of entertainment and a genius at selling human specialties.

Whether we are dealing with human, or chemical specialties, the principle is the same. The principle involves first, that we have a product unique in character and second, that we find a use for this unique product.

Must Have Real Economic Worth

It is Barnum's own confession that it took a lot of ingenuity to sell his human specialties. No less ingenuity is required in selling chemical specialties. However, the analogy ends here. Freaks do not serve a utilitarian purpose, but the sale of chemical specialties must fundamentally be useful for some practical purpose. No amount of ingenuity can build a repeat business unless the product fills a definite economic need. Ingenuity can only introduce a product. Continued sale depends on the usefulness it can render the purchaser.

Since everyone possesses a modicum of curiosity, Barnum had theoretically an unlimited market, and if we can believe his own confession, the theoretical market which he turned into a practical market was dependent upon his ingenuity. The same can be said about chemical specialties. The market is tremendous and is only limited by the ingenuity of the sales force, and the ability of the research laboratory to develop new products or find new uses for those already developed.

The day of empirical formulation is over. Industrial purchasers are buying more and more, even where specialties are concerned, on specifications issued by their respective laboratories. For this reason we maintain modern, well equipped, analytical, bacteriological, and research laboratories. Since we serve a diversity of industries our equipment must be comparatively greater than other classes of laboratories. The successful company in the specialty line today, as well as tomorrow, demands full utilization of the results of chemical research.

Oil Specialties

There are thousands of chemical specialties and, of course, it is impossible in an article of this type to attempt to cover the field. For this reason the writer has of necessity limited himself to the specialties handled by the firm he is connected with namely: oil specialties. Oils may be divided into two classes according to their origin, first, mineral oils coming from the earth and second, organic oils, the product of animal or vegetable life.

Oil specialties are either of the first-class or a combination of the two classes. As is well known, animal and vegetable oils enter into two important reactions, namely: sulphonation and saponification. By a combination of these reactions various oils such as olive, castor, sperm, etc. can be given peculiar properties. Many of these oils become emulsifiable in water upon

sulphonation, and in many cases, so much so that the oil is practically in solution. Another very important property of oils with which we are all familiar is their peculiar lubricating properties. These properties render oils of inestimable value to industry.

Few people realize how great a part oil specialties play in the manufacture of various goods, such as textiles, leather, paper, glue, laundry products, metal working, paint and varnish and a host of others. Suffice to say that no man goes through a day of his life without using some article in which these oils have figured in their manufacture. Moreoever, every day, in the various industrial processes, these oils find new uses. The extent to which this market will grow will entirely depend upon the ingenuity of the specialty salesmen and research laboratories in finding new applications.

Special Selling Force

It follows axiomatically that the selling of specialties requires a very specialized selling force. There are two salient requirements demanded of the specialty salesman, one is a very thorough knowledge of the properties of the products he is selling and the other ingenuity in finding a use for these products. Naturally, he must possess other qualifications demanded in any type of salesman, but these two salient qualifications are almost indispensable.

As I have pointed out a working knowledge of the properties of our products is of the utmost importance. Our company manufactures about seventeen hundred different items. These products, to justify their existence, possess certain advantages over the regular staple lines or offer entirely new advantages. Most of our products go into manufacturing processes wherein they increase the quality of the finished product or lower the cost of manufacturing. For this reason the salesman must have at his finger tips an exact knowledge of the products and the advantages they offer to the manufacturer. To aid him he is given two sales manuals, one dealing with the technical information concerning the products and their uses and the other being purely a sales instrument.

The Specialty Salesman A Pioneer

The pioneers in the early days went into unknown lands. They hunted, fished, explored and cultivated the soil and laid the foundation of civilization. The cornerstone of their success was ingenuity since the lack of proper implements forced them to rely a good deal on their inventiveness. They had to do things differently or not at all. The specialty salesman must go out in much the same pioneering spirit. Armed with a thorough knowledge of his products and their properties, it is his business to see how and where these products can be used to the best advantage by various manufactories.

Ingenuity

To what extent ingenuity enters into selling specialties may be gathered by the following incident taken from one of our salesmen's reports. Not so long ago a large manufacturing company was troubled by the fact that it had to copper plate a large portion of its metal articles to prevent a scratchy surface during drawing, even though a good drawing paste was used. Naturally, after drawing, this copper surface had to be removed again by pickling. All this involved considerable labor and expense. The problem was explained by the Superintendent to one of our nimble minded salesmen, who, after listening very attentively to the problem, surprised his prospect by saying, "I believe I can solve your problem, I have a product which will not only eliminate your plating, but will act as a drawing lubricant as well." The

SAMPLE QUESTIONNAIRE

To be mailed IN DUPLICATE with sample to Harrison Office.

(1) From.....(2) Town.....

(3) Business of user..... (4) Goods made by user .....

(5) Product represented by sample .....(6) Made by .....

(7) Price of product..... (8) Quantity used per month.....

(9) Is it satisfactory?..... (10) If not, why?.....

.....

(11) How soon must you have reply?.....(12) How many other firms use same product? .....

(13) What is the product used for and what effect is it expected to produce? .....

.....

.....

(14) Is the product used as such or is it compounded with other ingredients? What are they and in what proportions are they used?.....

.....

(15) CONDITIONS UNDER WHICH THE PRODUCT IS BEING USED

(a) As a solution?.....As an emulsion?.....What concentration?.....

Is solution or emulsion acid in reaction?.....Degree.....

" " " " Alkali in reaction?..... Degree.....

" " " " Neutral? .....

(b) Temperature at which product is used?.....

(c) If the product is dissolved or emulsified with water, what is the degree of hardness of the water used?.....

(d) If the product is used as an emulsion, is the emulsion being agitated while it is used?.....

(e) If the product is used as an emulsion without agitation, how stable must the emulsion be under conditions of use:-

.....DAYS .....HOURS .....MINUTES

(f) Is the solution or emulsion renewed completely after use or is it strengthened by the addition of fresh material?.....

(16) Is an exact match required or could product be substituted which is slightly different from the submitted sample but which is as good or superior so far as the desired effects are concerned?.....

IMPORTANCE RATING [by office] .....

Date mailed.....Date received..... SAMPLE SENT BY.....

SALESMAN

Use reverse side for remarks

product the salesman offered was tried out and worked satisfactorily.

The product contained a metal combined with an organic radical which, due to the heat, created by the drawing operation, was decomposed into its component parts, leaving a film of metal on the article drawn, which functioned in much the same manner as the plated copper. The customer undoubtedly had in mind a better drawing compound, never dreaming of being able to dispose with copper plating, exemplifying "Killing two birds with one stone" sort of thing. This is only one of the many examples which come to me daily. However, it is sufficient to show how valuable an asset a versatile mind is to the specialty salesman.

Complete Cooperation Necessary

Since the application of a specialty product to any specific operation necessitates a thorough knowledge of that operation, it can be readily seen that the salesman must get the complete cooperation of the manufacturer in order to be of any help to him. The manufacturer must be willing to divulge information concerning his processes and to cooperate with the salesman as much as possible. To obtain this cooperation experience has taught that the salesman must win confidence in himself and in the company that he represents.

In the incident related above, the Superintendent explained the process thoroughly to our salesman and cooperated in story book fashion. This is because we began at the end of our story. Its first part is that of hard work. Nothing was said of the futile calls previous to getting an audience and a chance to tell his story.

Winning Confidence

Once the story is presented, then comes the hard task of creating confidence. Confidence once established the prospect usually is quite willing to divulge the necessary information. Needless to say, most of this information is of a strictly confidential nature and is kept so unless permission is obtained to the contrary. This information is the life-blood of our business, since without it it is evident that we can be of little assistance to our customers.

This information gleaned by our 30 odd salesmen from all parts of the country on every conceivable subject is, therefore, carefully recorded. It is obvious that unless this information is recorded it would remain scattered, quickly lost and unavailable when most needed. One of the most important jobs of the salesmen, as well as the Technical Department, therefore, is keeping a systematic record of all knowledge gathered relating to the application of our products.

The Mechanism of Keeping Records

This is no small job although the method is fairly simple. The salesman is supplied with a regular report sheet and a questionnaire which he fills out and sends to the Sales Manager, together with other necessary data on every call he makes. Sometimes the solution of a problem presented by the prospect flashes across the salesman's mind at the time he is interviewing the prospect. In this event, the salesman merely sends in a recommendation as to the products needed on his regular report sheet. If, however, the solution of the problem is not apparent, then it is the duty of the salesman to get as much information on the problem as possible. He fills in the questionnaire, and in addition, gives as much information as possible on his regular report as to what is wanted. The problem then becomes one for the laboratory to solve. Since the basis of all the research work is fundamentally derived from the salesman's reports and questionnaires, a complete file of these are kept on record by the Sales Manager, as well as the laboratory. The file is sub-divided according to the type of industry, type of operation, and type of problem to be solved. A laboratory number is given each problem or job. A corresponding number is then given to the laboratory report of this job and this coupled with the salesman's reports, forms a complete continuity on that one particular problem.

How The Laboratory Backs The Salesmen

Thirty chemists are kept busy solving the problems that our salesmen discover. As many as one thousand problems are sent in during the year. Not all of these are solved. The unsolved problems are segregated in a separate file and reviewed and followed up once a month. By going over this file periodically, fresh ideas are brought to bear upon the problem and additional work done on it. No problem is allowed to die a natural death until sanctioned by both the Technical Director and the Sales Manager. It is surprising how often the solution of one problem has a bearing on another. Problems that seem almost hopeless of solution are very often attacked by a method suggested by another problem in an entirely different sphere.

New Products Develop New Uses

The ramifications through which the business of selling specialty oil products can lead one seems to be almost infinite. A new product is developed, such as an emulsified paraffin wax for the paper trade. Later, this product finds uses in spot proofing textiles or spraying coal to make it dustless.

Like Sinbad the Sailor, our products travel into many parts of the world, to Alaska and South Africa, to combat dust and disease, to assist in making all sorts of products from machinery to decalcomanias, to serve all kinds of plants from potteries and mines, to garages and boiler factories.

Can Production Be Planned Without Communism?

By Sir Arthur Salter

THIS vast experiment raises questions of the first importance which cannot yet be certainly answered.

Is there really a tolerable halfway stage between capitalism and communism? Are effective planning and control compatible with economic and political freedom? Can we devise a new framework of law, customs and institutions within which free enterprise and competition can find a place without intolerable abuses?

To these vast questions we can only suggest the most tentative and provisional answers. And our best approach will consist in a discussion of the fundamental facts from which the present movement originates.

Ordered economic progress depends upon two different kinds of factors. There must be sufficient material resources and the knowledge, skill and industry to utilize them. We need to be able to produce enough to satisfy human needs. There must, however, also be a system which enables specialized activities to be so adjusted to one another that they combine to produce wealth without waste or destructive reactions, and the product to be justly distributed. We need to regulate our productive capacity.

Now the relative importance of these two factors differs enormously at different times. Until the industrial revolution the fundamental factor was scarcity. The resources of nature to which men had access were insufficient, or the scientific knowledge and applied skill required to exploit them were lacking. The vast bulk of mankind was doomed inevitably to the barest of existence. Several consequences followed inevitably. In a world of scarcity, competition—between individuals, between classes, between countries—was the predominant element in human relations. And the first need of any economic or social system was to give the maximum stimulus to industry and to invention.

After a century and a half of scientific invention and improved industrial organization, this situation is entirely changed. We have enough knowledge and skill to produce not only the necessities but also the reasonable luxuries of all mankind. But the problem of using the productive capacity at our disposal, involving as it does the coordination of infinitely varied specialized processes, is immensely more difficult. The principal task of man today is not to increase productive capacity but to construct a system within which the capacity already available can find its full scope and its products be justly distributed.

The effect of this fundamental change will be not to abolish competition but to make it of less importance than it has been in the past in relation to combination and cooperation. The point may be best illustrated by imagining the position of two men on a desert island on two different hypotheses. The first is that the resources of the island are so limited that, whatever the effort put into developing them, they will not suffice for the reasonable needs of both; the second is that they are potentially so rich that, by the combined effort of the two men, they can be increased many times and be amply sufficient for all needs.

The same force is profoundly modifying the economic system in another respect. The function of individual competition in the laissez-faire system of the nineteenth century was not only to stimulate activity; it also, through a changing price system, adjusted supply to demand and each one of an infinitely complex series of specialized activities to all the others. The profound changes in economic organization which attend modern mechanization are obviously interfering seriously with this function.

True, the disturbances resulting from the war have thrown an altogether abnormal strain on the system. But it is also clear that the old economic system is failing, and destined increasingly to fail, in its essential task of securing that our productive capacity is fully utilized and that its products are justly distributed—in other words, that each increase in productive capacity is attended by an equal increase in consuming power.

Under these conditions the problem before the world is not merely how to escape the present depression; it is how to transform its system to meet the new needs.

It will be well to start with a few guiding principles.

If we are to have a planned and directed system compatible with both political and economic freedom, the planning and control cannot be left to government alone. The task is too vast and intricate. Government can only control by methods which would be destructive of all freedom. It is inside the system itself that we must find those who will, in the main, plan and control—and they must do so through their own institutions.

The economic system needs, in fact, what I may call an "institutional self-discipline," aided but not in detail directed by the government. It must, in every sphere, develop appropriate institutions through which, to the extent required, individual activities can be regulated.

Effective Competition

Those who occupy directing positions in every sphere must regard themselves as having not a single but a double responsibility. First, they must conduct their own business efficiently. Second, they must construct, in cooperation with others engaged in similar activities, a framework of general policy and regulation which will prevent the action of the individual in business from reacting destructively upon others or upon the general public interest.

For the great bulk of industrial activities, adjustments of supply and demand can safely be left to the ordinary competitive process subject only to such general regulation as the government can impose. It is only in relation to the very large industries which have become so organized as to have a semi-monopolistic character that special action is needed.

In these industries effective competition has so far disappeared that it cannot be relied upon to adjust supply to demand, and their financial resources and scale of production are so great that they may be a decisive factor in the movement of the trade cycle. It is therefore essential that the automatic price-system of adjustment should be supplemented by deliberate policy and that this policy should be determined by the general economic position.

The very fact that these particular industries have developed on such a scale as to impede the normal working of the price-adjusting system means that they are in the hands of a manageable number of persons. These persons could be united in an industrial council and could wield a sufficient authority to determine policy throughout the industries concerned.

Let me take one example of method. If it became evident, at a given moment, that expansions were proceeding to a dangerous point which was bound to lead to overproduction, a reaction and a slump, the whole situation could be substantially relieved, without any need for fixed quotas, by a temporary suspension of the system of instalment sales. This would at once reduce production just when this was necessary and would preserve purchasing power for the coming period of falling demand.

It is obvious that these proposed institutions, concerned with currency, credit and industrial policy, would need to be closely linked up to central policy. The obvious instrument for this is a central economic council composed of representatives from the sectional institutions referred to and also of persons of other forms of experience, including economists and government officials. The effectiveness of such a body depends upon its members being really representative. An externally composed body will never obtain the necessary action throughout the whole economic organization.

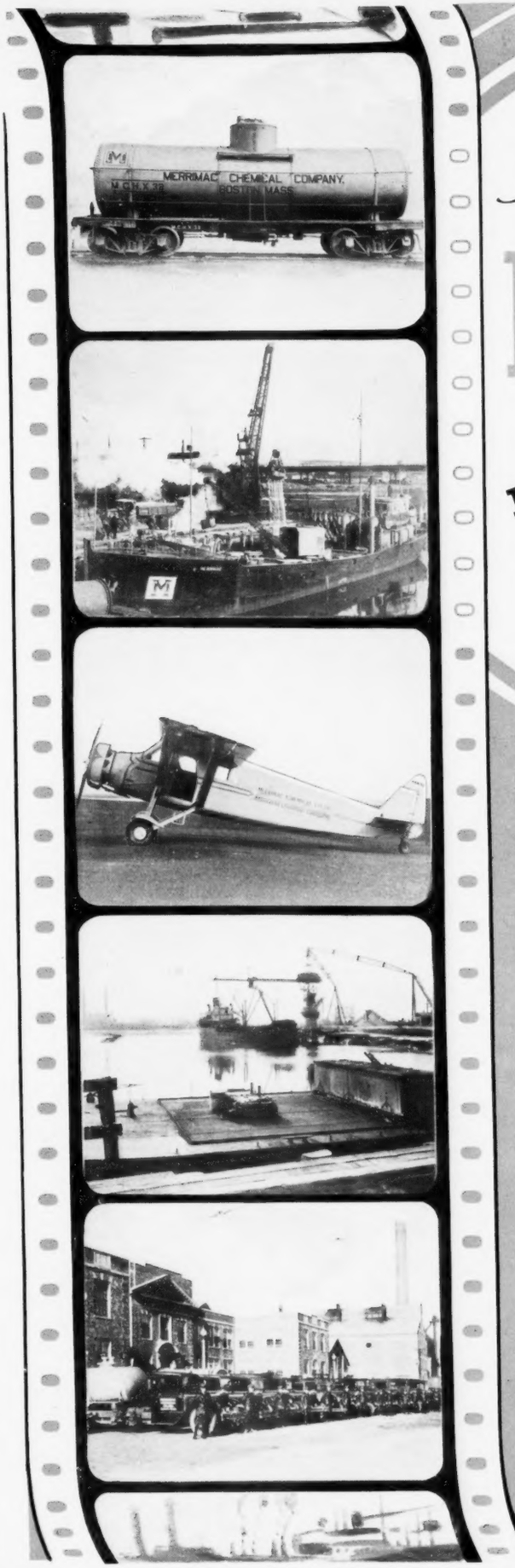
What would be the main principles of the system here outlined? First, control and regulation would be limited, both in range and in character, to what was absolutely necessary. The free system, and the normal working of competition, would be left to operate just so far as it did not result in obvious waste or abuses.

A deliberate collective program might, for example, be required for steel production, but the ordinary competitive system might be left to decide how many people should make radio sets or razor blades. So, too, when a collective program was necessary, control would be limited to seeing that it was carried out, and would not penetrate into the detail of industrial organization.

Secondly, the whole system should be conceived of as growing up from below, not imposed—though it might be guided—from above. It would be better, for example, that those engaged in foreign lending should, subject to certain safeguards, themselves develop and apply the rules and methods required to protect the public interest. And the ultimate central authority should similarly be composed in the main of persons drawn from those who occupied actual directing positions in the business world and were taking part, each in his own sphere, in the appropriate specialized regulation and control. That is, the system should be one of economic self-government, not of State management.

Lastly, the government in such a system would have a role at once limited and invaluable. It would supply guidance, coordination, stimulus and—when necessary, but only then—compulsion. It would supplement by direct State organization where private organization failed. But even in regard to such functions it should act on the advice of those engaged in actual economic activity and in the direction of the external institutions described.

Such a system would be one of real economic self-government. It would be elastic and adaptable to changing needs. It would allow room for freedom of enterprise and choice, while providing just enough control to stop actual abuses. It would leave the price system functioning, but supplement it where it was failing. It would be not so much a middle way between laissez-faire and communism as a selective combination embodying the best of both and avoiding their defects.



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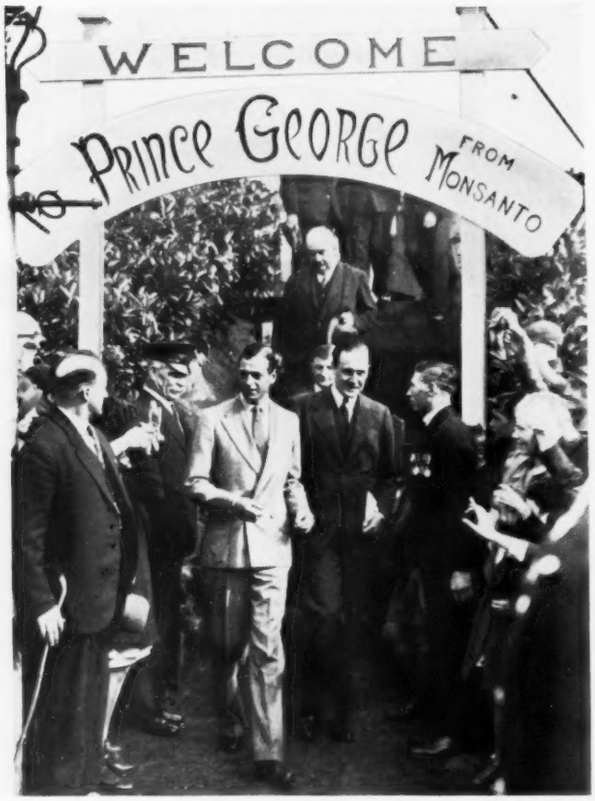
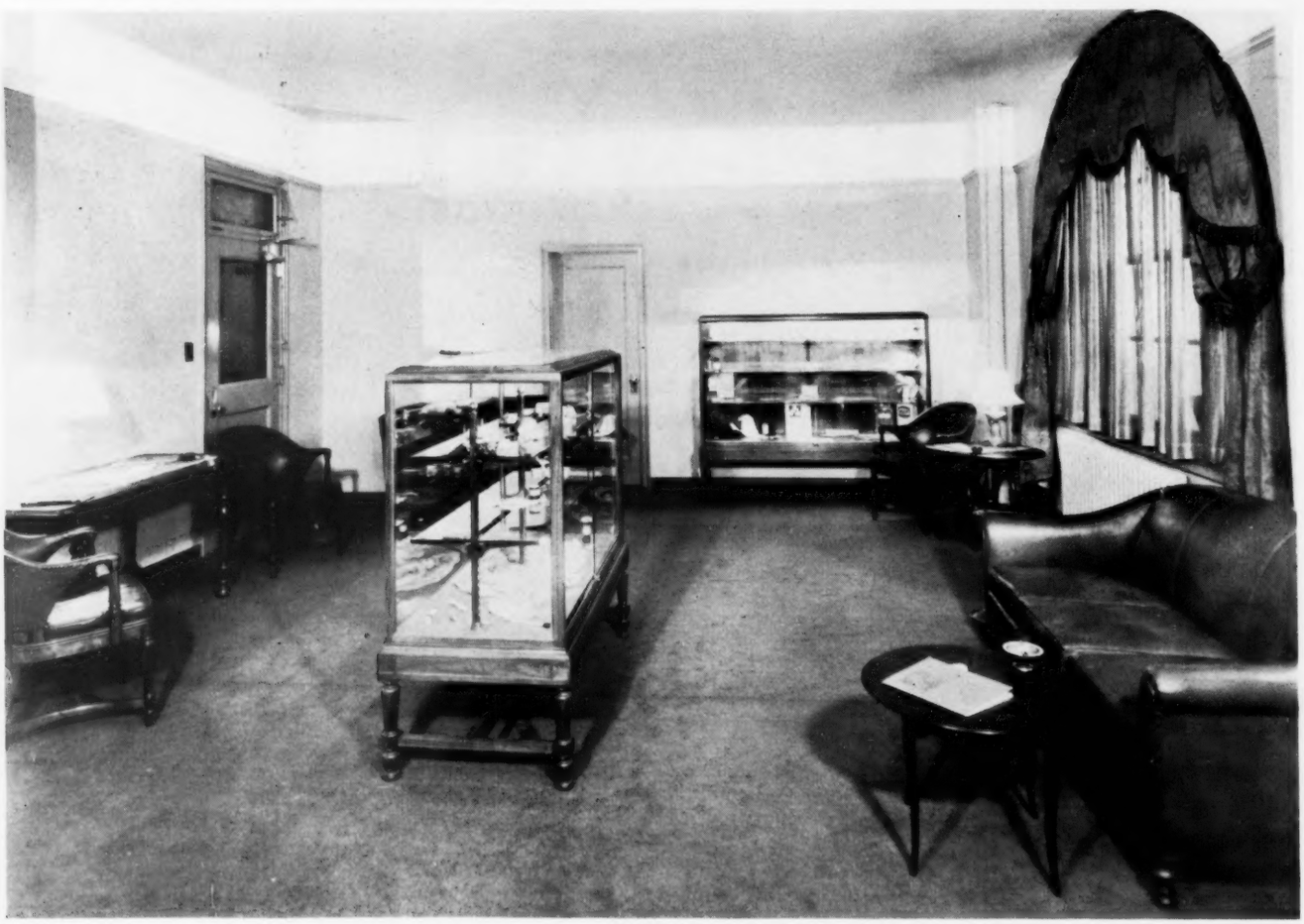


New power plant at the Ruabon (North Wales) Works of Monsanto, was formally put into operation by H. R. H. Prince George, shown entering the Recreation Club with Mr. T. P. Berington, Vice-Chairman, Monsanto, Ltd., and Dr. W. H. Garrett, Manager, Ruabon Works.

Three fine chemical magnets spied at a Century of Progress, left to right, Vic Williams (Monsanto), Jim Kerrigan (Merck), and Rock Snow Mallinckrodt).

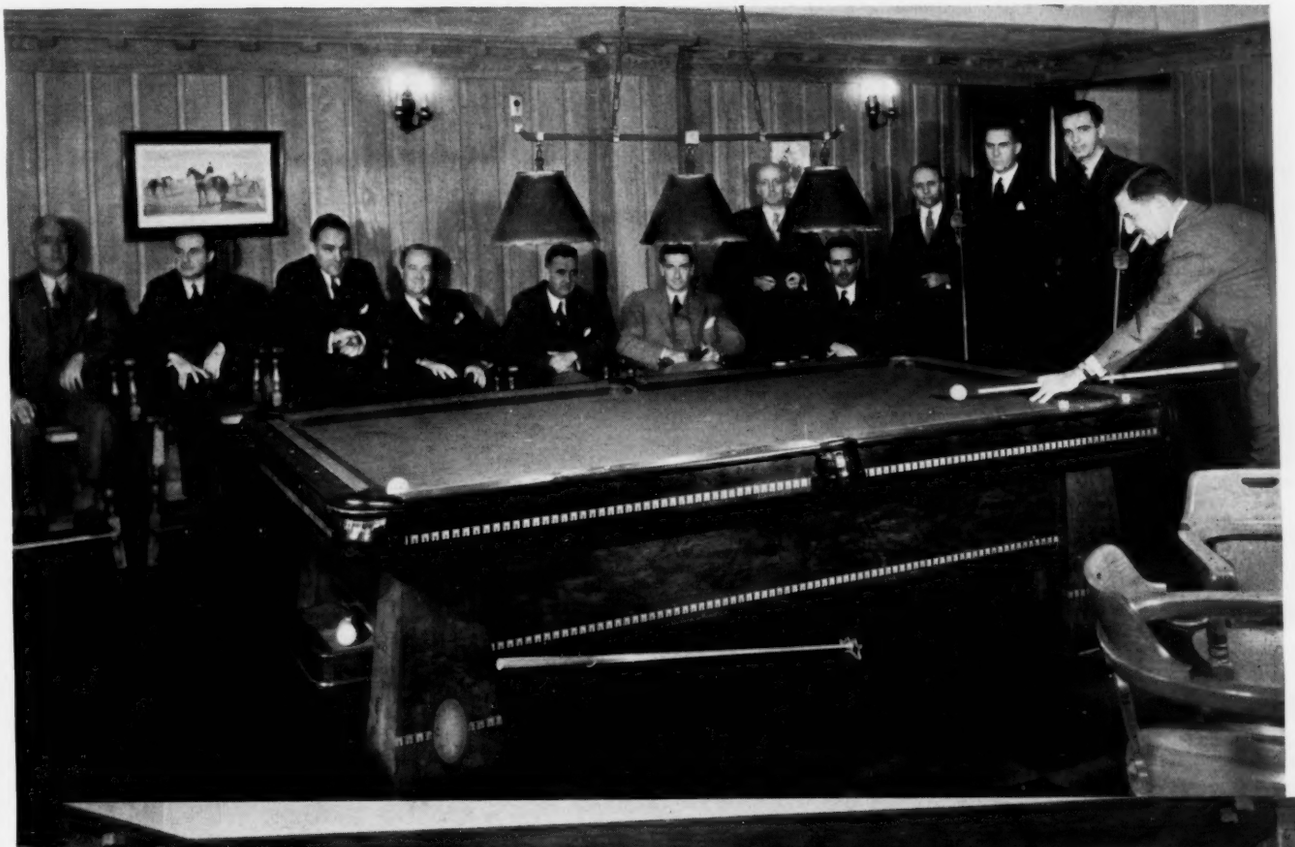


Reception room at the Hercules Powder Company's Plant, Wilmington, Del.

NEWS REEL

of Our Chemical Activities

Christening the new tap room in the Chemists' Club. Grouped about the billiard table left to right are Ralph Dorland (Dow), Harry Farleigh (Michigan), Lou Neuberg (Warner), George S. Cooper (H. B. Prior Co.), Esse Routh (Mathieson), John W. Boyer (Calco), W. W. Winship (Thermal Syndicate), William F. George (Chemical Industries), J. R. Minevitch (E. B. Badger & Son Co.), Ray Harcombe (Michigan), Howard Farkas (U. S. Stoneware), and handling the cue is Harry Mabey (Mathieson).



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Chemical Consumption

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Colors for Ceramics

Ceramic colors other than lustres may be divided, roughly, into two main groups—(a) colored glazes, and (b) body and engobe stains. Over- and underglaze stains can be regarded as subgroups of (a). The color produced in the first group depends not only on the nature of the pigment employed, but on the composition and method of preparation of the glaze to which it is added, or over or under which it is applied, and also on the conditions of firing.

The second group, perhaps of less importance from the industrial point of view, is not subject to quite so many disturbing factors, as the chemical reactions between the body or engobe and the pigment are not as intense as the action of a fusible glaze on the coloring agent. The range of colors obtainable in the second group is, however, probably much more limited than in the former. Glaze and engobe stains may be of a more expensive nature than body stains, as the latter permeate the whole substance of the ware. Body stains should be of strong staining power, but inexpensive.

Colored lustres, which form another class of ceramic colors, briefly mentioned here, are formed by the application, under appropriate conditions, of resinates, sulfoterpenes, oleates, stearates, oxalates, or benzoates of iron, nickel, chromium, manganese, gold, platinum, cobalt, uranium, vanadium, etc. Mixed lustres in which two or more metals are used, give more varied and finer colors than when single metals are employed.

Almost every color of the spectrum can be reproduced in ordinary ceramic glazes with the exception, perhaps, of purples and lavenders, to which approximations can be made by the use of gold compounds or by the partial reduction of copper glazes in a manner described later.

Cobalt, in the form of oxide, carbonate, or phosphate is the agent most widely used for the production of blues, many shades of which can be produced by sintering with alumina, zinc oxide, etc. In conjunction with chromium compounds, a further extensive series of shades may be obtained. Copper compounds can also be used for certain blues. Berdel[1] gives the following formula for a turquoise glaze: Frit–saltpetre, 80.8 parts; soda ash, 26.5; copper oxide, 8.0; red lead, 34.4; quartz sand, 120.0. Glaze—Frit, 214 parts; white lead, 20 parts. This glaze is matured at about cone 07. The body of the ware to be glazed should be free from lime and as siliceous as possible.

Baggs and Littlefield[2] found that under certain reducing conditions copper can be used for the production of lavenders, purples, and reds, the color depending on many factors in glaze composition and firing conditions.

Satisfactory results were obtained with the following glaze base: raw borax, 15.50 parts; powdered sodium silicate (grade S. S. 20), 5.55; feldspar, 36.06; whiting, 8.63; kaolin, 16.70; and flint, 16.50. White bowls were covered with this mixture, to which 5 to 7 per cent. of its weight of stannic oxide and 0.3 to 1 per cent. of copper carbonate were added. Patches of the same glaze base, to which had been added 0.3 per cent. of its weight of copper carbonate, 1 per cent. of silicon carbide, and 1 per cent., of stannic oxide, were applied over this, and the ware was fired to cone 9 in an oxidizing atmosphere in 24 hours. The desired red color developed only on the intended areas, with no sign of reduction on the main blue portions.

Other satisfactory results were obtained with the following Glaze, also maturing at cone 9: feldspar, 40.0 parts; flint, 40.0; borax, 12.0; whiting, 18.0; copper carbonate, 0.6; and tin oxide, 2.0. This was applied to biscuit ware (fired at cone 3,) selected areas of which had been previously treated with a slip containing from 0.5 to 2.5 per cent. of silicon carbide. A consistent development of reduced copper colors occurred over the slip-coated areas. These workers also give formulae for low-temperature glazes, yielding satisfactory results at cone 012.

In this connection an anonymous ceramic technologist[3] states that beautiful effects can be obtained by treating biscuit ware with solutions of ammonium oxalate, ammonium phosphate, or potassium ferrocyanide, then pouring on to the body solutions of copper sulfate or other colored salts, and glazing and firing as usual.

Chromium, copper, and, to a less extent, vanadium, form the bases for the preparation of most ceramic greens. The use of the latter element appears to have been developed to a greater extent in America than in Great Britain, as it has not been possible there to produce with it (or with molybdenum or tungsten) colors which cannot be obtained equally well with cheaper oxides.

Chromium base colors are stable within very wide firing ranges, and may be used for any class of color from body stains to overglaze. No zinc compound must be present with chromium, or a brown zinc chromate may be formed. A high percentage of lime is desirable to aid in the development of a good color.

Copper greens are bright and transparent, but are liable to lose much of their beauty if fired above cone 6. Copper, like chromium, has a tendency to produce metallic films if too much color is added to the glaze. When used in conjunction with uranium, yellowish greens are produced.

The use of metallic zinc for producing a pleasing green vapor glaze on bricks[4] has come into prominence in recent years. Pig or moss zinc is used for the purpose in a manner somewhat similar

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to ordinary salt glazing. In conjunction with cobalt, uranium compounds have been used to develop greens. These are not as opaque and intense as chromium greens, but are not subject to the reddish discoloration which chromium compounds sometimes give.

Uranium is the primary base for the production of the best yellows, and is used extensively in this country for the purpose. According to Parmelee[5] the uranium compounds used in ceramics are the green oxide, U_3O_8; the black oxide, U_2O_5; and substances known commercially as "uranium yellow," which may consist of either sodium uranate ($Na_2U_2O_7$), hydrated sodium uranate ($Na_2U_2O_7.6H_2O$), potassium uranate, or ammonium uranate. These compounds are of importance in the development of pure yellows and oranges at comparatively high temperatures, but are used comparatively sparingly on account of their cost. It is said that uranium glazes may be used with satisfactory results at cones 6 and 7, and, with less certainty, to give yellows at cones 10 to 12.

In lead glazes, bright orange yellows are given by uranium under oxidizing conditions. Bremond[6] states that yellow colors with a uranium base are developed especially well in highly calcareous glazes, owing to the formation of a calcium uranate.

The Japanese Pottery Laboratory, Kyoto, gives, the following Glaze as being suitable for use at cone 012 and 011: white lead, 35 parts; quartz, 10; and ammonium uranate, 8. A glaze of the following composition—white lead, 35 parts; quartz, 10; ammonium uranate, 7; and ferric oxide, 1—is said to have the following wide color range: cone 01, reddish orange; cone 1, brown; cone 1-2, red brown; cone 5, yellowish green or vermilion; and cone 8-9, blackish brown.

Yellow crystalline glazes can also be obtained by the use of uranium and titanium compounds in conjunction. The following has been published as a Glaze of this nature maturing at cone 5 to 6: white lead, 70 parts; ammonium uranate, 16; quartz, 20; and rutile, 7.

A process[7] has been patented for the production of a yellow pigment to replace cadmium sulfide, Naples yellow (a compound of lead and antimony oxides), and sodium uranate. It is said that sodium uranate and Naples yellow are in general only usable at temperatures up to 1,100° C., and cadmium sulfide at much lower temperatures; and that these compounds are, in addition, poisonous.

Their process is, briefly, as follows: refractory white oxides, such as stannic oxide or zirconia, are calcined at temperatures between about 1,100° and 1,500° C. with small quantities of oxides of vanadium and/or molybdenum. In this way very refractory pigments, which withstand firing temperatures of about 1,300° C., are said to be obtained. Oxides of tungsten, uranium, manganese, etc., can also be added, in amounts of about 1 or 2 per cent., to the refractory oxides before calcination, in order to give modifications of color. The following is an example of the method of preparing pigments by this process: one hundred grams of stannic oxide are calcined at a temperature of 1,250° to 1,450° C. with 2 to 3 grams of aluminum hydroxide and 2 grams of ammonium vanadate. A bright green-yellow pigment is produced, which is suitable for use as an under-glaze or glaze color.

Titanium dioxide can be used as a body stain for the production of yellows. According to Parmelee[8] if this oxide is present in clays used for making hard porcelain, the effect of iron oxide will be intensified and a yellowish tint obtained. For this reason titanium dioxide has been used in the production of dental porcelain, to give a more natural tint.

In glazes, titanium dioxide, often in conjunction with zinc oxide, is used to develop cream, ivory, tan, and yellow, and to form crystalline titanates. These crystals form readily in all types of glazes, provided that proper conditions with respect to concentration, character of the magma, and the time and temperature of firing are observed. Experiments carried out with glazes for porcelain matured at cone 10 gave colors varying from a slight yellow with 5 per cent. of titanium dioxide, to a deep yellow with 10 per cent. of rutile, in the latter case the percentage of iron oxide present having considerable influence.

Zinc and chromium together, iron oxide, and manganese oxide, form the usual bases for browns, but the production of certain shades of titanium dioxide in conjunction with other oxides will be described below.

Red is one of the most difficult colors to produce in a glaze. Various shades of brownish red can be obtained from the many different forms of iron oxide, but according to Iliff[9] the only true bright reds are those given by cadmium-selenium glazes, fired at a low temperature. These glazes must be matured carefully in a short quick firing. The pigment employed is prepared[10] by fusing together selenium oxide and cadmium sulfide in the proportions of 20 parts of the former to 80 of the latter. The pigment can be used successfully in a boric glaze, maturing at a low temperature, but not as an overglaze color. It should be applied freely on a porous biscuit. Other reds are obtained, as mentioned, by the use of copper compounds under appropriate reducing conditions, and also by uranium compounds[11].—*Abstracted from Chemical Trade Journal.*

1. "Keramos", 1931, 10, No. 15.
2. "Jour. Amer. Cer. Soc.", 1932, 15, 265.
3. "Sprechsaal", 1931, 64, 756.
4. "C. T. J. & C. E.", March 10, 1933, p. 197.
5. "Foote Prints", 1929, 2, Pt. 1, 3.
6. "La Ceramique", 1932, 35, 226.
7. E. P., 379, 572, 1932.
8. "Foote Prints", 1929, 2, Pt. II, 19.
9. "Cer. Ind.", 1932, 19, 113.
10. Polgrean, "Eng. Cer. Soc.", 1929, 28, 87.
11. Hol, "Keramos", 1931, 10, 669.

Ceramics

New Safety Glass Cement

The result of an invention of synthetic rubber to meet Germany's needs in the last days of the World War, a new cement to be announced shortly has proved satisfactory in most rigid tests and showed its superiority over other similar products.

Ceramic Inks for Porcelain

Most methods for the permanent marking of porcelain vessels in the laboratory involve the use of mixtures of pigments and fluxes finely ground in certain vehicles, which though quite satisfactory for the purpose, require the use of materials not commonly found in the research laboratory. L. Kebrick, writing on this subject in the *Chemical Analyst*, has for some time used aqueous alkaline solutions of certain very common salts which serve as ceramic inks for porcelain, one of which has the following compositions:

Na_2CO_3	—	1 part
$Na_2B_4O_7.10H_{20}$	—	2 parts
K_2CrO_4	—	3 parts
H_2O	—	40 parts

In the marking process, the borate and carbonate function as fluxes; the chromate as the source of color. The viscosity of this solution does not differ materially from that of ordinary writing ink, hence is easily applied by means of a pen.

The method of application is simple: the marking is made on the clean porcelain surface and held near a Bunsen flame to evaporate the water, after which it is strongly heated in an oxidizing flame to develop the green color of the chromium compound. In this way a vessel may be marked in about one minute, since ordinarily sufficient solution runs from the pen to impart a suitable depth of color to the characters. When a blast lamp is employed, the markings are greenish black, probably due to the formation of a chromium silicate.

Other solutions have been prepared in which potassium permanganate or potassium ferricyanide or similar salts which yield

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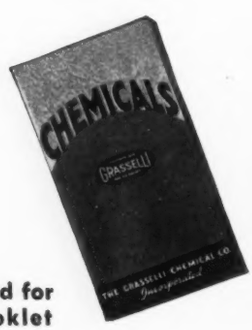

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colored compounds upon ignition, and are capable of existing in alkaline solutions, are substitutes for the chromate. Preliminary tests indicate that these may also be used as ceramic inks. Other alkalies may be substituted for the carbonate with equally good results.

Spraying Molten Glass

Continuous filaments are produced when molten glass is sprayed from an electro-metallizing pistol, the high viscosity of the liquid preventing the disruption into particles of powder which molten metal undergoes on issuing from the apparatus.

Metals and Alloys

Nickel-Plating Zinc with Lactates

Extensive research has brought to light the fact that lactates possess, to a marked degree, the property of direct nickeling of zinc. Experiments proved that: (1) displacement of nickel from its solutions by zinc is retarded by salts of hydroxy acids, alcohols, and dextrose. (2) Lactates are especially effective in retarding deposition by immersion. (3) Good deposits of nickel on zinc may be obtained from solutions containing lactates; the yellow tone of deposits from citrate-bearing baths is not met with. (4) The best deposits are obtained at a pH between 3.7 and 4.3. More acid baths decrease the possibility of streaking; more basic baths decrease the adhesion. (5) Highly acid or ammoniacal baths may be buffered to the optimum pH by the addition of excessive amounts of ammonium lactate, but the plating characteristics of such baths are not altered by the buffering. (6) The ratio of lactate to nickel in the baths must be increased as the concentration of nickel is increased.

Influence of Dissolved Oxygen on Corrosion Losses

The slow but certain tuberculation and eating away of water pipes by some waters is adding an enormous amount to the cost of modern civilization. Engineers and chemists are constantly studying the theories and mechanics of corrosion because it is only through better understanding of fundamentals that they will be able to diminish losses due to corrosion.

Thirty years ago, R. W. Whitney, now vice-president of the General Electric Company, announced that the corrosion of metals was an electrochemical process and this view is now generally accepted. When a metal is in contact with even slightly acidic solutions, corrosion takes place by the chemical process of the metal replacing the hydrogen in the acid. The acid dissolves the metal and thereby hydrogen is released.

Released hydrogen coats the metal surface with an electrically charged layer that prevents the chemical reaction from continuing at the initial rate. If the hydrogen layer is built up to a sufficient thickness the reaction is practically stopped. However, under natural conditions, the hydrogen combines with the oxygen of the air or that dissolved in the water to form more water and solution of the metal goes on. The amount of oxygen available to remove the protective hydrogen blanket determines the extent of corrosion.

Impure metals are corroded more quickly as a rule than pure metals. Electrochemists believe that this is due to the impurities taking up the oxygen. Contrary to the popular belief, however, pure metals are subject to corrosion under the action of certain acid solutions. Prof. O. P. Watts of the University of Wisconsin has recently shown that if oxygen is absolutely excluded copper will not corrode in a solution of sulfuric acid, a reaction that is very rapid in the open.

The importance of the dissolved oxygen content of the atmosphere, of corrosive water and other liquids, is thereby once more emphasized. When this element is present in high concentration a higher pH value must be maintained to prevent corrosion of mains than otherwise and particularly of household services or piping subjected to increased temperatures which create accelerated attack.

This suggests that there may be some doubt as to the merits of aeration of certain waters which are normally aggressive, unless the pH value is raised sufficiently by alkali addition to reduce the hydrogen-ion concentration considerably below that of pH 7 which is commonly considered to represent a neutral water. It has in fact been demonstrated that ofttimes waters high in oxygen content and low in hardness must be raised to pH value 9.5 in order to check even the cold water corrosion of mains.—*Water Works and Sewerage.*

Patents—Metals

Process for electroplating chromium by electric current in solution of chromic acid and a fluoboric compound. No. 1,928,284. Colin G. Fink, N. Y., and H. D. McLeese, Detroit.

Leather

Preparation for Synthetic Tanning

A water soluble portion from degraded lignite, obtained by treatment with chlorine, nitric acid, alkali metal sulfite, oxygen or air, and one of several water soluble condensation products forms a mixture for synthetic tanning. The condensation products mixed with the lignite may consist of materials similar to the following examples: 1. A water soluble product obtained by condensing resorcinol with benzaldehyde. 2. A condensation product prepared from a naphthalene sulfonic acid and formaldehyde and sodium acetate.

Leather Preservative

Treatment, by applying to dry leather a mixture of gum copal in aniline oil, and aluminum oleate in petroleum oil, mixed with additional amounts of turpentine asphaltum, spirits of turpentine, turpentine Japan and asbestine powder, which greatly increases the wearing and waterproofing qualities of the leather, has been perfected and patented in U. S.

Treating Tanned or Non-tanned Skins

Treatment of animal hides comprises an aqueous solution of a sulfonic acid compound of the general formula: R. X. R. $_1SO_3Z$—, wherein X stands for O, S, O.CO.O, CO.O, NY, CO.NY O.CO.NY or YN.CO.NY (Y being hydrogen, alkyl or aryl), R. stands for a saturated or unsaturated aliphatic radicle containing more than 8 carbon atoms which may be substituted. R_1 stands for an aliphatic radicle which may be substituted and Z stands for hydrogen, an alkali metal or NH_4.

Tanning Value of Sulfite Cellulose Extracts

Most satisfactory results in tanning may be had by mixing the extract with ordinary tanning extract, either in the suspenders or the drum. Retanning only with cellulose extract is not practical; 20-25 per cent. can be used for retanning. The tanning value of the extract is lower than that of vegetable extracts; this value for sole leather is about 50 per cent. and for upper leathers about 75-85 per cent. of the value of regular vegetable extracts.

Boric Acid in Tanning

For many stages of leather manufacture use of boric acid, which is antiseptic and has no corrosive action on hides and leather, and borax, which can be used both for neutralizing tan liquors and for HO softening, is advocated. As a denaturant in salting hides, borax is free from the tendency shown by $K_2Cr_2O_7$ or $CuSO_4$ to spot or damage the fibres. In the softening bath preparatory to depilation, 0.05—0.1% borax effectually prevents bacterial action, and renders the epidermis readily susceptible to the depilatory. For deliming, H_3BO_3, because of its sol. Ca salt, is both the safest and cheapest acid to employ; 3% H_3BO_3 on wt. of hide removing 90% of total Ca, and, unlike other acids,

produces a soft grain without undue swelling. Borax has also distinct advantages over other salts for neutralizing vegetable tannin baths and chrome tan liquors, fixing tanned leather for currying, and washing leather preparatory to semi-chrome tanning; when used in the last-named process it renders the leather almost white. It is used as a mordant in leather dyeing. In leather finishing, H_3BO_3 has the advantage over lactic acid in being free from Fe and other undesirable impurities, while borax facilitates the lixiviation of tannins from tan barks, inhibits their fermentation in tan liquors, and reduces their astringent action on hides. Finally, H_3BO_3 acts as a preservative for egg-yolk in tawing preparations.

Patents—Leather

Process of treating tanned or untanned animal hides with aqueous solution of sulfonic acid. No. 1,927,910. G. Balle and P. Heinke, to I.G.F., Frankfort.

Textiles

Radioactive Textiles

Production of a textile containing a radioactive substance in such close combination that no loss in activity occurs as a result of washing and other processes has been announced abroad. This is said to be achieved by dissolving radium sulfate, i. e., in the rayon spinning solutions. Fabrics giving off mild radiations result from the addition of 0.02 per cent. of the radioactive substance to the solution. Higher proportions of radium salt naturally render the fabrics more intensely radioactive.

Dyestuffs with Soap-like Properties

The dyestuffs are produced by treating hydroxy or amino-group containing dyestuffs, as such or at any stage in their manufacture, with such organic monobasic sulfonic acids or their halogenides or such monobasic carboxylic acids, their halogenides or anhydrides as contain substituted or unsubstituted hydrocarbon radicles of the aliphatic or cycloaliphatic series corresponding to soap-forming carboxylic acids, so as to esterify or acylate the said hydroxyl or amino group. Dyestuffs of the azo, triphenylmethane, azine, oxazine, thiazine, xanthene, acridine, and anthraquinone series are specified. The products may be sulfonated. They produce a lather in solution and gelatinize to soap-like jellies, and textiles may be simultaneously dyed and rendered water-resistant with them. The following examples are given: (1) H acid is *N*-acidylated with stearyl chloride, and the product is coupled in alkaline solution with any suitable diazo component; (2) *p*-phenylenediamine (1 mol.) is condensed with tetradecyl sulfo-chloride (1 mol.) (from corresponding sulfo acid and phosphorus pentachloride), or with fatty, naphthenic or resin acids, and the product diazotized and coupled with azo components; (3) aminoazobenzene, benzene-azo-α-or β-naphthylamine or the aminoazo-naphthalenes are condensed with capric, lauric, oleic, or ricinoleic acids, or with naphthenic or resin acids (colophony) and the condensation products sulfonated; rosaniline, safranine T or Lauth's Violet may be similarly treated.

Reducing Rayon Luster

Current patent literature indicates much research to discover new and improved methods for delustering acetate rayon. Steady progress is being made in the direct production of low luster rayon yarns by the obvious method of adding opaque pigments, for example titanium oxide, to the cellulose acetate spinning solution. Several new methods have been discovered for delustering acetate and other rayon goods during dyeing and finishing processes. It is too early to predict which method will prove most satisfactory. At the present the finisher is generally responsible for delustering.

According to the first patent (E. P. 391773) uniform delustering is secured by placing rayon in a bath containing two reagents which react only, on heating, to form an insoluble precipitate and which because of the slowness of its formation becomes evenly distributed within and without the rayon. A solution containing urea and a titanium salt behaves in this manner. The same principle may be employed with stannic chloride, and in this case sodium acetate is added to the bath to cause slow precipitation. This process is somewhat reminiscent of an earlier method in which rayon is delustered by immersion in a bath of magnesium silicofluoride (E. P. 337418) which forms a precipitate as the temperature is increased from cold to 90° C.

In the second process (E. P. 391847), cellulose acetate rayon goods are immersed for a short time in a hot bath containing a quaternary ammonium salt such as cetyl or lauryl pyridinium bromide, these particular compounds having been previously described in E. P. 379396. Thus a full matt effect is obtained by treating acetate rayon (100 parts) for ½ hour at 95° C. in a liquor (2,000 parts) containing 5 parts of cetyl pyridinium bromide.

The third process makes use of a principle first pointed out in E. P. 258699. In delustering acetate rayon by a double precipitation process such as by first treating with barium chloride and then with sulfuric acid, there is a tendency for the first applied reagent to dissolve out of the rayon during the second treatment and thus lead to precipitation of an insoluble pigment on the surface of the rayon instead of within it. According to E. P. 392593 this dissolution can be largely prevented by having present in the second bath a large quantity of a substance which decreases the solubility of the reagent used in the first bath. The principle is applicable to viscose and natural silk. Thus a mixture of these fibers may be impregnated with a 30 per cent. solution of magnesium chloride and then immediately (without intermediate drying) passed through a 50 per cent. solution of sodium carbonate almost saturated with sodium chloride; magnesium carbonate is precipitated within the fabric thereby delustering it, while the sodium chloride prevents the magnesium chloride dissolving out of the fabric during the precipitation process. A. J. Hall, *Textile Colorist*, p. 621.

Month's New Dyes

Celliton Yellow 3GN Powder

New dyestuff of the General Dyestuff Celliton range suitable for dyeing acetate silk. Dyed from an olive oil soap bath, bright greenish-yellow shades are obtained, somewhat greener and brighter than Celliton Yellow 3G Powder. The dyeings possess fastness to light, water, washing, perspiration, and chlorine, very good fastness to hot pressing and acid, and excellent fastness to scooping. Also recommended for direct and discharge printing, giving pure white discharge effects, and, in addition, has the advantage over the old 3G brand of a better affinity, the shades being much fuller. Working methods and patterns are given in pamphlet distributed by company.

Alizarine Direct Blue AGG

Direct Alizarine dye of General Aniline, handled in this country by General Dyestuff, produces bright blue shades possessing good fastness to perspiration and excellent fastness to light. Because of its level dyeing properties, it is particularly suitable for the dyeing of mode shades on ladies' dress goods and its good fastness to water and to salt water makes it valuable for the dyeing of carpet yarns. The shades do not change under artificial light. A sample card may be seen.

Diphenyl Green FF

New direct green is offered by Geigy Co. adapted for cotton and artificial silk (except acetate silk). It is also recommended for the covering of cotton in unions and because at ordinary temperatures it leaves the wool white, while at temperatures above 120°F. the wool is slightly stained. It discharges well and has excellent fastness properties. The manufacturers have issued a sample card showing dyeings upon cotton piece goods, unions and discharge effects upon viscose.

National Erie Fast Orange WS

A new direct dye of National Aniline which produces about the same tones as National Erie Fast Orange A, but its superior solubility makes it better suited for use in machines, especially those of the package type. Possesses excellent fastness to rubbing, storing, organic acids and alkalies; good fastness to light, mineral acids and sea water, and is especially suitable for dyeing cotton and rayon materials and for unions where it is not essential that the animal fibers be entirely unstained. The manufacturers have issued a sample card.

New Vat Printing Powders

Carbanthrene printing powders differ distinctly from the orthodox types of vat pastes with which the printing trade has formerly had to contend. The new National Aniline line of powders are said to disperse instantly and can be stirred directly into the "printing gum" requiring no "pasting up" with water or other solvents. Their finely divided state and the resulting action following the dispersion of the powders in the gum, results in an extremely homogeneous and non-specking paste, and they remain unchanged indefinitely instead of drying out, settling, caking on container sides, or frosting during winter months. Accurate weighings of the powders assure a closer check on actual color shop consumption, and more positive adherence to established methods as successive patterns are returned for "repeats." The final results are brighter colors; sharper, clearer prints, with assurance of penetration coupled with the elimination of waste resulting from the archaic dipping method.

Protection Against Moisture

The ingredients of a recently patented composition, which claim complete indifference to moisture and improved general durability, are 30 parts red phosphorus, 10 parts antimony trisulfide, 2 parts manganese dioxide, 3 parts carborundum, 4 parts umber, and 40 parts of a 10 per cent. solution of pararubber in benzene. After allowing the solvent to evaporate until a slightly moist mass remains, the latter is pressed into sheets from which the remaining traces of benzene are removed by drying at 40° C.

Patents—Textile

Cellulose derivatives retaining original structure of fiber, with strong affinity for acid dyes. No. 1,929,868. R. Haller and A. Heckendorn, Basel, to Society of Chemical Industry.

Cleaning medium for textile fibers and materials—an emulsion of acid dispersant, volatile organic fat solvent, vegetable thickener and sour milk. No. 1,927,839. C. Ludecke and W. Wilcken, Berlin.

Sizing agent for cellulose acetate silk; a water-soluble hydroxy alkyl ether. No. 1,928,996. H. Gensel and M. Hagedorn, Germany, to General Aniline Works, N. Y.

Coatings

Water-soluble Esters

Two water-soluble cellulose esters, both manufactured on a commercial scale, are being offered abroad. A recent product is a glue of cellulose base intended for use in preparation of interior paints and for wall paper coating. This is known as "Glutolin SL 100" and another similar product is known as "Membranit."

Plasticizers and Softening Agents

For softening, smoothing, or revivifying agents for textiles and leather, or as plasticizers in cellulose ester and ether compositions,

Paints for Ship Hulls

Antifouling paints according to English Pat. 393, 375 consist of oil paints to which have been added the active principles of plants of the general Tephrosia, Louchocarpus, Derris, and Daguelia, known under native names such as Tuba, Barbasco, Cube, Haiari, Timbo. The ground leaves, stems, roots, or aerial roots may be used, or extracts obtained by the use of solvents.

Patents—Coatings

Process and production of titanium dioxide from titanium tetrachloride. Nos. 1,931,380-1. H. Haber and P. Kubelka, to Krebs Pigment & Color Co., Newark, N. J.

Paint, varnish, lacquer or enamel rubbing compound, of soap in suspension, abrasive and pine oil. No. 1,927,872. P. H. Kramer, to Park Chemical Co., Detroit.

Drying composition for oxidizable oils, paints, varnishes and resin derivatives, using as a siccative a certain metal salt of a toluic acid. No. 1,927,867. H. A. Bruson, Philadelphia.

Rubber

Slate Flour for Fillers

As a substitute compounding ingredient for whiting, barytes, clay, talc, etc., finely powdered slate waste has been suggested for the manufacture of mechanical rubber goods and hard and soft rubber molded articles. The scope of this investigation by an English authority comprised experimental examinations of the physical and chemical properties of three samples of slate from North Wales. One was gray slate powder intended as a filler for asphaltic and bituminous road surfacing compositions and showed 1.77 per cent. grit on 90-mesh. The other samples were air-floated gray and green slate flour showing, respectively, on 300-mesh 0.001 and 0.004 per cent. grit.

The conclusion of the investigation was as follows: The effects of slate flour or powder when added to a 95:5 rubber-sulfur mixing are: shortens time of cure required to give optimum mechanical properties, reduces elongation at constant load, increases hardness and permanent set, and slightly lowers the scleroscope resilience. Ordinary slate powder reduces tensile strength and in the proportion of 13 volume per cent. has no effect on total resilient energy. Up to 13 volume per cent. air-floated slate flour slightly increases tensile strength, and up to 27 volume per cent. increases resilient energy. During aging at 70° C. slate accelerates stiffening, and the green air-floated flour accelerates oxidation and perishing; while the ordinary powder appears to retard the fall in tensile strength.

As a compounding ingredient, ordinary slate powder roughly resembles natural whiting, both materials having similar effects on hardness and permanent set; while air-floated slate flour has a slightly greater stiffening effect and rather more favorable effects on tensile strength, resilient energy, and scleroscope resilience than whiting. Judged by tensile strength and resilient energy, the ordinary slate powder is inferior to whiting. The ordinary slate powder, being relatively coarse and gritty, is probably suitable only as a filler for a very cheap type of mixing. On account of its color it would probably be impossible to use slate in any quantity in white mixings.—*India Rubber World, Oct.'33.*

Latex Paste

Patent has been applied for the manufacture of a latex paste hich is purified, stable, and can be dispersed again with water. ocess falls into 2 parts. First the latex is purified; the rubber spersion is separated from the latex (which may be diluted) at a drogen-ion concentration of about 10^{-5} (pH between 4.8 and 2) so that a flocculent layer, but not a gel, results. Layer is then moved from the serum.

The next step is to bring the rubber dispersion, thus purified, to hich anticoagulants, antioxidants, or protective colloids are lded, to a hydrogen-ion concentration of 10^{-6} at most, after hich the whole is concentrated by evaporation, in vacuo or ot, at high temperatures, and a dough-like or solid rubber pro-

duct is obtained which is reversibly dispersed. The required hydrogen-ion concentration is obtained by means of a mixture of sodium acetate and acetic acid.

The advantage of a hydrogen-ion concentration of 10^{-5} is, first, that the flocculent layer can be separated directly from the serum without filtration. Secondly, a stable product is obtained, which does not result at other concentrations of acidity.

Evaporation may be followed by spraying according to the Krause-Hopkinson process if a product perfectly free of water is desired.

Patents—Rubber

Guanidine salts of fatty acids and production process. No. 1,931,395. Winfield Scott, to The Rubber Service Labs, Akron.

Chemical process for creating products having high stability to attrition from rubber. No. 1,929,373. H. Mark and H. Hopff, Germany, to I.G.F., Frankfort.

Patents—Miscellaneous

Agricultural

Non-corrosive insecticidal compositions from barium fluosilicate. No. 1,931,367. E. B. Alford, to Grasselli Chemical Co.

Mixed fertilizer process, by treatment of non-liquid mineral acid decomposition products of the raw phosphates with ammonia. No. 1,930,883. H. Oehme and E. Herrmuth, to Chemische Fabrik Kalk, Cologne.

Preparation of fertilizer by adding soluble fertilizer material to moist fibrous matter and heating the mixture to dissolve tne fertilizer. No. 1,930,542. S. J. Smith, Chatham, Ontario.

Digesting phosphate rock with acid under super-atmospheric pressure, adding fertilizing materials and reducing pressure, with final ammonia. No. 1,929,710. Beverley Ober and E. H. Wight, to The Oberphos Co., Baltimore.

Sodium nitrate and other fertilizing substances from microcosmic salt in nitric acid, concentrating and further nitrating. No. 1,929,002. F. Mitteau, France, to Societe d'etudes Scientifiques, Belgium.

Process of making and separating a light-weight low-density Paris green. No. 1,928,771. B. P. Webster, to Chipman Chemical Co., Bound Brook, N. J.

Insecticide from water, rotonene colloidally dispersed, and pyridene base. No. 1,928,256. H. A. Jones, Cherrydale, Va., to the Government and people of the U. S.

Petroleum

Purifying petroleum sulfonic acids from mineral oil treated with sulfuric acid. No. 1,930,488. K. S. Ramaaya, Brookyln, to L. Sonneborn Sons, Inc., N. Y.

Hydrogen gas treatment for purification of crude, liquid, paraffin wax, with catalyst of 2 elements from bismuth-vanadium-iron. No. 1,930,468. Mueller-Conradi and Werner, Germany, to Standard I.G. Co., Linden, N. J.

Reducing deterioration of cracked anti-knock gasoline by use of camphor, camphorphorone and camphoric acid. No. 1,930,248. J. C. Morrell, to Universal Oil Products Co., Chicago.

Low temperature carbonization of carbonaceous material of oil-bearing residues. No. 1,929,649. M. Pier and K. Winkler, Germany, to Standard I.G. Company, Linden, N. J.

An emulsified product, of 15% plus alcohol, an oil and water. No. 1,927,916. D. P. Brown and H. C. De Hoff, to Standard Oil Development Co.

Recovery of pure saturated fatty acids from crude acids of soaps from products of oxidation of paraffin wax. No. 1,927,841. Martin Luther and H. Franzen, to I.G.F., Frankfort, Germany.

Continuous method for light lubricating oils from stock with unsaturated hydrocarbons, to be oxidized then treated by sulfuric acid. No. 1,927,823. L. L. Davis and G. L. Atkinson, to Continental Oil Co., Oklahoma.

Process for separating acidic gases from mixtures by liquid absorbent agent with regeneration through aliphatic and cycloparaffin amines. No. 18,958 (reissue, original 1,783,901). R. R. Bottoms, to The Girdler Corp., Louisville.

Paper

Sizing composition for paper, of refined tallol in rosin size. No. 1,929,115. E. J. Johnstone, Lockport, N. Y.

Manufacture of paper pulp from colored rags by hot caustic alkali, water and hydrosulfite alkaline solutions. No. 1,929,145. S. Lenher and H. F. Lewis, to E. I. du Pont & Co.

Plastics

High sulfur content plastic comprising ethylene and a sulfurized phenol plastic. No. 1,927,929. Carleton Ellis, Montclair, N. J.

Plastic containing methylene sulfide and a sulfur-containing resin. No. 1,927,930. Carleton Ellis, Montclair, N. J.

Sulfonated condensation products of aromatic compounds, with carbonyl radical from group of furane aldehydes and their amides. No. 1,928,647-8. Ellis, Olpin and Kirk, Spondon, England, to Celanese Corp. of America.

Laminated structure of flake mica, using as binder a polyhydric acid-polybasic acid reaction product, a plasticizer, and adhesive agent. No. 1,928,713. H. C. P. Weber, to Westinghouse Co.

For materials having surface elements soluble in organic solvent, to be joined to similar materials, adhesive made up of gum thus, glyptal resin, acetone, ethyl acetate, castor oil and gelatine and casein solutions. No. 1,929,013. W. H. Church and J. E. Snyder, to du Pont Cellophane Co., N. Y.

Cellulose

Modified aliphatic acid anhydride for esterifying cellulose while maintaining its structure. No. 1,930,895. R. Haller and A. Ruperti, to Society of Chemical Industry, Basel.

Derivatives from cellulose whose base reacts with an etherifying agent to produce a halogen-containing ether. No. 1,930,471. Henry Dreyfus, London.

Process for the manufacture of cellulose derivatives. No. 1,930,472. Henry Dreyfus, London.

Cellulose organic ester—a cyclic acetate. No. 1,930,136. H. B. Smith to Eastman Kodak Co., Rochester, N. Y.

Cellulose organic ester a lower alkyl ester of a substituted benzoic acid. No. 1,930,135. H. B. Smith and S. J. Carroll, to Eastman Kodak Co., Rochester, N. Y.

Cellulose organic ester composition containing propylene chloride. No. k, 1,930,134. H. B. Smith, to Eastman Kodak Co., Rochester, N. Y.

Decolorizing a dyed cellulose acid sheet material. No. 1,930,133. M. J. Reid, to Eastman Kodak Co.

Purification of aryl esters of phosphoric acid containing naphthalenic impurities. No. 1,931,059. E. Clemmenson, to Monsanto Chem. Co., St. Louis.

Concentrated organic acid pre-treatment of cellulose, for making acetone-soluble cellulose acetate with aldehyde. No. 1,930,145. T. F. Murray, Jr., and H. LeB. Gray, to Eastman Kodak Co., Rochester.

Cellulose ester composition. No. 1,930,142. J. G. Capstaff, to Eastman Kodak Co., Rochester.

Company Booklets

C53. J. T. Baker, Phillipsburg, N. J., October issue of *The Chemist Analyst* features method for the determination of the sulfur content of flue gas; methods for increasing the sensitivity of chemical reactions; and a number of other laboratory suggestions for the wide-awake chemist.

C54. Binney & Smith, Inc., 41 E. 42 st., N. Y. City. The Black Art of Rubber Compounding (Chart No. 23), covers briefly technical history of standard Micronex and also discusses quality of old stocks of carbon black on hand. It also describes briefly present-day application of Micronex, Micronex W-5 for wire insulation, Dustless Micronex and Fumonex.

C55. Columbia Alkali Corp., Barberton, Ohio. New leaflet describes advantages attending use of "Col-Rec" on coal. This is a new product recently developed by Columbia Chemical's research laboratories.

C56. Columbia Alkali Corp. Columbia's manual of refrigeration is looked upon with great favor by operating men. Latest edition has been enlarged, contains special operating data of great value and affords space for a handy brine record.

C57. Grasselli Chemical Co., Cleveland, Ohio. New booklet describes Grasselli 3 Inhibitor, its various advantages, directions for its use, etc.

C58. E. I. du Pont de Nemours & Co., Wilmington. September-October issue of the *Du Pont Magazine* is devoted largely to the story of Alfred B. Nobel, discoverer of dynamite and description of "Triclene" R. & H.'s new dry-cleaning solvent.

C59. Eastman Kodak, Rochester, N. Y. October issue of Synthetic Organic Chemicals features technical article on the preparation of azoxy compounds.

C60. Hercules Powder Co., Wilmington. This outstanding house-organ contains in addition to the usual amount of strictly company chatter a survey of the Hercules' chemicals used in leather manufacture and also interesting information on "Daintex" Hercules' latest contribution to the laundry.

C61. Hercules Powder. The Virginia Cellulose Dept. has issued a 30-page brochure "Hercules Chemical Cotton: Best Source of Cellulose". It describes manufacture and use of chemical cotton and its wide industrial application in synthetic fibres and as a basic material in nitrocellulose and cellulose acetate. Book is also printed in German and French.

C62. Mallinckrodt Chemical Wks., St. Louis. October price bulletin lists 12 declines and 36 advances.

C63. Mathieson Alkali Wks., 250 Park ave., N. Y. City. "Hypo-Chlorination of Water" is a 72 page water works hand book covering many applications of H. T. H.—high test hypochlorite in purification of water.

C64. Merck & Co., Rahway, N. J. Merck's October Report is largely featured with news of the Company's Century of Progress exhibit. The usual price changes are also listed together with market comment.

C65. Monsanto Chemical Co., St. Louis. The 13th edition of the list of Monsanto chemicals arranged alphabetically includes several new products. Such a list is invaluable to the purchasing agent.

C66. New Jersey Zinc Co., 160 Front st., N. Y. City. Booklet consists largely of 23 charts which have appeared in this producer's advertising, preceded by a brief history of the use of zinc oxide in rubber and the part N. J. Zinc played in this development. Charts illustrate rate of cure tests of various experimental compounds designed to emphasize differences between "fast" and "slow" curing zinc oxides.

C67. Philadelphia Quartz Co., 121 S. 3rd. st., Philadelphia. October's P's & Q's reviews some of the advantages of sodium silicate uses in the box industry.

C68. R. & H. Chemicals Dept., E. I. du Pont de Nemours & Co., Wilmington. Quarterly price list shows several important price revisions.

C69. Standard Chromate Co., Painesville, Ohio. H. B. Prior Co., Inc., agents, 420 Lexington ave., N. Y. City. A booklet on bichromate is of more than passing interest. The opportunity of providing the trade with a comprehensive survey of the uses, properties, etc., of the leading Chrome chemicals has been taken advantage of and an excellent job done. Result is really an authoritative text-book that will prove very useful to all employing chrome chemicals in industry. Considerable space is devoted to bichromate in tanning; detailed formulae are provided; details of operation, methods of analysis, etc. An equally detailed account of the part played by bichromate in the dry color industry is also provided. Other large consuming industries specifically mentioned are dyes and intermediates, textiles, brass and copper, chromic acid, green glass, corrosion prevention (in refrigerating brine systems). Latest accepted methods of analysis of sodium bichromate are given and a number of important solution and concentration graphs are provided. A copy of this booklet should be in the hands of every bichromate user.

C70. Rossville Commercial Alcohol Corp., Lawrenceburg, Ind. October "Rossville Alcohol Talks" deals with use of alcohol in petroleum industry and is a continuance of the September issue.

C71. Solvay Sales Corp., 61 B'way., N. Y. City. A new 6-page leaflet describes the various uses of calcium chloride.

C72. The Baker Castor Oil Co., Morgan & Washington sts., Jersey City. Reprint of recent advertising listing new alkyl ricinoleates-revolutionary products now finding wide variety of uses as plasticizers, dispersing and grinding media, emulsifiers, detergents and "wetting out" agents. Baker's "P" Line of alkyl rincinoleates consists of 16 new chemicals each with separate and novel physical and chemical properties that make their investigation by chemists imperative.

Chemical Production

A digest of plant management, design, equipment and containers for the makers of chemicals.

Labor and Economics

By Neil Carothers

What is the effect of shortening hours of labor? What would the 30-hour week do to Americans? Why does the President's Re-employment Agreement call for 40 hours for clerical workers and 35 for mechanics? For answers do not consult economists. They are not sure. They realize that such enigmas as these have defied the ablest minds. But you will receive a ready answer from any politician, even though he does not know his own mind from day to day and on no day can present a vestige of history or logic to support that day's fancies; or from any labor leader, blind to any interest but that of the small minority he represents.

As a 1st step toward solving these questions let us set down 3 propositions which laws of economics seem to prove.

(1) There is no such thing as overproduction. (2) Underconsumption did not cause the depression. (3) The greater the total production the better the condition of labor.

If these propositions are true, as they appear to be, the following conclusions are inevitable. There are some important provisos and exceptions, but they are none the less truths: (1) Shortening hours does not benefit labor. (2) Raising wages does not help the unemployed. (3) Forced raising of wages and shortening of hours will not end a depression.

What does history show about this ancient problem of the hours of labor? Ten thousand years ago your ancestors lived bestial lives in an endless search for food. Three thousand years ago myriads of miserable slaves toiled ceaselessly to build a useless pyramid. Five hundred years ago a hundred peasants plied the needle from dawn till dark. In the new factory system of Europe not much more than a 100 years ago, children of 5 worked from 4 in the morning until 10 at night. For years Parliament debated wisdom of prohibiting employment of children under 9 more than 12 hours. Until modern times miners worked 14 hours a day, 7 days a week. The 12 hour day and the 7-day week are recent memories.

It is an unhappy circumstance that the nature of this progress toward a decent life for all men should be grievously misunderstood. Men misread the plain facts that underlie their own improved condition. By very reason of this unhappy correlation between increased production and shorter, better-paid toil they have come to believe a monstrous error, the general theory of over-production as a social menace.

The economic order is a vast machine, of marvelous productivity and equally extraordinary delicacy. At intervals the machine breaks down. When this happens, the entire processes of consumption and distribution are so paralyzed that temporary surpluses of products develop, and we have the sadly familiar phenomenon of want in the midst of plenty. This leads to the erroneous belief that these surpluses, wholly a result of depression, were the original cause. Therefore whatever reduces production helps to restore prosperity and whatever compels spending and waste improves conditions, culminating in the melancholy spectacle of hogs slaughtered and milk poured out and wheat destroyed in a hungry world.

There cannot be any general overproduction. There may be, rarely, overproduction in certain lines, and overproduction at unnatural prices and valuations is undoubtedly a factor in depression. Four million automobiles could not satisfy in 1928, while a million and a half cannot be sold in 1933. This is a breakdown in distribution, not overproduction. Prosperity is always greatest in times of greatest productivity, misery in times of lowest production, as now.

This monumental misinterpretation of the economic process might truly be called the father of economic lies. In one direction it inspires ponderous articles by pseudo-economists giving awesome figures of excess productive capacity in our steel and auto and textile plants. This reached its finest flower in the incomprehensible gibberish of technocracy. In another direction this error appears as the "fallacy of spending," the false idea that blind spending assures prosperity.

This error appears in its most harmful form in the theory that there is a fixed and rigid volume of work to be done, so that any development that reduces the need for labor is a menace to wages, employment and prosperity. This belief guides the policy of organized labor and dominates the philosophy of those high in authority in our government. It has bred a progeny of ill-favored offspring. One is the bitter opposition to the introduction of machinery which has marred the record of labor from the riots to prevent the use of the power loom more than a hundred years ago to the protests against bottle-blowing machinery. Another offspring is the notion that time off for spending is necessary to proper "consumer power." The most sinister of all these children of error is the theory that a nation can create prosperity by arbitrary reduction in hours and blind increase in wages.

The 1st fact is that in all history shorter hours and higher wages have been wholly a result of economic improvement, never a cause. Wages, now, as always, are merely the workers' share in the total social product. Every hard-won improvement in labor's condition has been labor's share in an increased national productivity. Whether they like the relationship or not, whether

they are properly recognized as such or not, workers are partners of capitalists and landowners in a joint enterprise.

There is less land per capita than ever before, more mouths to feed, more bodies to shelter. Yet there is an astonishingly better living for all. In the main this is due to one simple economic phenomenon, the displacement of labor by machines, the improvement in processes which "threw men out of work."

The people may take the rewards of increased productivity in one of 3 forms, in higher wages, in shorter hours of labor, or in additions to the population. Until our time the animal fecundity of our ancestors, encouraged by Church and State, absorbed most of the benefits of increased productivity, and only the frightful mortality of the Middle Ages made it possible for the survivors to obtain any of the fruits of economic progress.

The phenomenal increase in productivity in Europe and America in the last century has been distributed fairly evenly among the 3 options, shorter hours, higher wages, and increased population. In Washington's time the country supported 3 million with a typical wage of 50c for a 13-hour day. This same country now supports 130 millions with a typical wage of $3 for a 9-hour day. This distribution came about through relatively free competition.

Three Partners In Industry

Any increase in productivity tends to be divided fairly justly among the 3 partners in production. The capitalist class cannot long confiscate the share that belongs to labor by economic law.

The ghastly exploitation of labor over the centuries has been due much less to capitalistic greed than to economic law. The heart-breaking conditions of the early days of the factory system reflected the productive power of the workers. Possibility of continued exploitation is very small.

So we must face the fact that shorter hours and higher wages do not increase prosperity. They flow from increased production. When a nation abandons free play of competitive forces and embarks on a policy of regulation of hours and wages, it is playing with edged tools that may cut deep into the social body. Such a policy can have but 1 objective, and that is the establishment of shorter hours and higher wages than those the partners in production have arrived at in the great arena of competition. The 1 logical result is a reduction of total output and a lower standard of living for labor as a whole.

A special condition in this country makes regulation of hours perilous. We have the most elaborate and expensive machine investment per worker on earth. An hour cut from the workweek means more than a proportional cut in output. It means an hour's idleness for a machine whose cost is measured in interest on the investment before the machine wears out. A 30-hour week means a plant idle for 138 hours in 168. But there will be 2 shifts, or 3. Quite right; in many industries the only solution of the increased cost of idle equipment is through additional shifts, as many mill-owners have discovered since Aug. 1. But a reduction of hours from 44 to 30 without a reduction in weekly pay means a flat increase of labor costs of 47%. The "share-the-work" program does not mean 3 days a week for 2 men instead of 6 days a week for 1. This form of staggering employment has been adopted already by nearly all our major industries since 1931. Its value lies in its keeping down the numbers of the totally unemployed, reducing bread lines and the numbers dependent on charity. It has not restored prosperity.

A really drastic share-the-work program would give labor 2 of the 3 bonuses of increased productivity, shorter hours and higher wages, by cutting down total national output. It can be done in 1 way, by starving out of existence surplus population unable to get subsistence. A universal 30-hour week, with wages uncontrolled by law, would in the end lower our standard of living below the level which Americans demands.

Increase in labor costs, reflected in higher prices, would reduce consumption by working men and all others. An increasing portion of a diminishing product would go abroad to pay for indispensable imports. Foreign peoples, with longer hours and lower wages, would undersell us in all markets. Still higher tariffs would be necessary, further increasing the cost of living.

Add to the 30-hour regulation a legal minimum wage and see a sinister social situation develop. Productive efficiency of millions of workers is tragically low. All of us deplore a $7 wage for a 60-hour week, but this unhappy condition frequently measures efficiency. A 30-hour week with a stiff minimum wage would breed a growing mass of permanent unemployables.

Common sense frequently convinces where economic reasoning is futile. It is apparent that if the millenium could be achieved in this fashion the magic would have been discovered before the Senate found it in 1933. The sensible English or the practical French would have hit upon it before this. They have been struggling with poverty for a thousand years. Russian absolutism, entirely in the interests of labor, has found no legislative means of giving the average Russian worker a standard of living equal to that of an American apprentice dishwasher.

Do not be misled by the apparent prosperity of industries on very short hours and high wages. Henry Ford's famous recipe for permanent prosperity, a 7-hour day and a $6 minimum wage, has become 40 hours a week and 50c an hour for many of his employes. If an industry can grant exceptional terms to employes it is because of monopoly or other favorable conditions, and the favored workers have their advantage at the expense of the consumers, including other workers.

General Hugh Johnson wrote that a restoration of consumer power might possibly be accomplished by "an average work week of 32 hours with a minimum wage of 45c an hour for the lowest paid type of labor." But the 1st code approved under NRA called for 40 hours a week and a 32½c wage, with a 20c rate for learners. In permanent and temporary codes approved majority provide for 40 hours or more. Furthermore, almost every code thus far adopted is silent regarding the rates of wages of workers already getting more than the minimum wage established. This is most significant. It permits a part of the rising costs of operation due to the shorter hours and higher minimum wages to be taken from the pay rolls of the higher paid workers. This explains some of the recent labor disturbances.

And thus the NRA, honest effort to aid a stricken people, is not in actual operation the instrument of visionary theories about wages, hours and prosperity. The longer period of industrial and social distress has driven employers as well as employes to terms of labor that are tragically un-American. Stagnant business and intensified competition have forced employers to exploitation they themselves hate. — *N. Y. Herald-Tribune Magazine*, Oct. 8.

Plant Equipment

Glass-lined Equipment

Glass-lined steel and cast-iron process storage equipment have been in use 50 years, being 1st used in brewing, later in chemical production. Terms "glass-lined" and "glass-enameled lined" are interchangeable—refer to complex borosilicates, often pigmented with cobalt or other metals and fused at about 1,800° F. Predominent raw materials—silica and borax.

Glass-lined equipment is used because:—it protects equipment itself against acid action and rapid depreciation; it protects product against contamination and turbidity resulting from dissolved metallic salts; ease in cleaning and sterilization; improved yield by eliminating reactions that are catalyzed by metal.

Equipment in standard types may be differentiated as open and closed, vertical and horizontal, with and without jackets for heating and cooling. Unjacketed types are usually employed for storage and, when equipped with suitable agitators, for various mixing problems. They are furnished in both horizontal and vertical types, as dictated by available factory space. Subject to certain few limitations all-welded storage tanks are avail-

able in sizes ranging from the laboratory piece up to tank cars and 9000-gallon plant storage units.

Jacketed types are required in most manufacturing processes within the chemical industry, to permit heating by means of steam or circulated hot oil, or cooling with brine or water. While jacket stay bolts are not possible in enameled tanks, pressures up to 75 and 100 pounds per square inch are readily obtainable from welded-on steel jackets, through which are carried flanged glass-lined outlet connections with suitable stuffing boxes. Above the temperature range obtainable with steam, oil can be used safely up to approximately 600° F.

Majority of process units for reactions, distillation, digestion, etc., are closed jacketed type, with enameled steel agitators available in standard designs and, for acid conditions of maximum severity, in sizes up to 500 gals. Open jacketed evaporators in hemispherical shapes are extensively used for C. P. chemicals.

Failures are classified:

Use of pressures in excess of those recommended by the manufacturer. Localized overheating, such as from the use of direct flame or by allowing a stream of cold liquid to impinge on a small area within a jacketed tank that has been heated to a high temperature by a previous batch. Use against chemical conditions for which the equipment was not originally specified. Glass enamels vary in resistance and the conditions should be clearly defined prior to manufacture of the equipment. Fracture from mechanical abuse, such as a heavy metal nozzle at the end of a hose. Fracture from strain at clamped or bolted flanged joints. This can readily be avoided by the use of suitable gaskets and by tightening uniformly so that the metal itself is not distorted.

Nitration, sulfonation, and chlorintion, as in the manufacture of dyestuffs, is done in glass-lined apparatus, which is also used in preparing dyes for use in textiles. Also in production of synthetic resins, pharmaceuticals, toiletries, cellulose acetate, gelatin, lacquers, rubber accelerators, precious metals. P. S. Barnes (Pfaudler Co.) *Industrial & Engineering Chemistry*, Oct., p. 1080.

Plant Management

Research in the Plant

Progressive companies employ special production research staff to see that manufacturing methods are improved. Such department not only pays for itself but is directly responsible for increased efficiency. In other cases, it is accused of hindering production and adding to production costs. These conflicting opinions are not due to some industries being more suited to research than others; actually there is no industry whose methods may not be improved. Unfavorable verdict is the result of the research staff wrongly placed or because method of working is faulty.

Position of the engineering research staff must be definite. There must be no compromise between the production function and research function; each has its own separate and distinct part to play, although there must be close cooperation. Work of the engineering research staff is advisory; it must not concern itself too much with immediate output or it will stop introducing improvements. Although in an advisory capacity, it must ensure suggested reforms being given a fair trial, irrespective of the opinion of individual production heads.

Head must be a director, or at least a manager, who has power to force improvements when necessary. Moreover, he must be a man of scientific training and wide outlook. This is not to suggest that research as a function should be superior to the function of production. There must be no over-riding of one by the other. Differences of opinion should be discussed at regular joint conferences between two functions. Departmental heads will co-operate once status is acknowledged and will often suggest improvements.

Many firms encourage co-operation of operators by a "workers' suggestion scheme." Full reasons must always be given when workers' suggestions are rejected, otherwise scheme will be suspected and discontent will result. Occasionally it may even be wise to try out unpractical suggestions to satisfy workers that they are unpractical and encourage confidence in fairness of the management.

Systematic program is necessary to cover the ground and ensure working on right lines. Succession of unorganized and unrelated ideas regarding odd processes is not to be aimed at. There must be one unified policy of improved organization for the factory as a whole, and all individual reforms must fit into that scheme. The type of man chosen for the work should have had technical education, both practical and theoretical. He must have sufficient breadth to visualize large scale reforms and must avoid spending too much time on petty improvements not worth time spent on them.

While extravagance is to be depreciated short sighted parsimony may preclude any real results at all. An accurate estimating and costing system must be run in conjunction with research, so that before being applied, any new scheme may be costed to determine whether suggested expenditure is warranted. A return on capital of at least 20% is generally necessary to make schemes worth introducing.

Large savings may be realized by analyzing standard machinery and speeding it up to give greater output. This usually necessitates replacement and re-design of some working parts, such as the use of constant acceleration cams, strengthening and connecting rods. An increase in output up to 80% can often be obtained in this way at little cost. This not only saves additional machinery but reduces labor required, as there is usually a fractional surplus at each machine.

By means of laboratory tests it is often found that output can be increased and quality improved by altering a process. Higher temperature or refrigeration may lead to a considerable reduction of manufacturing period. Research to determine exact function of each part or ingredient results in considerable savings in raw materials. Use of better raw materials may save waste in manufacture or reduce process time. Cheaper raw materials may sometimes be used with advantage.

By studying flow through factory, improved lay-outs may be introduced which will reduce internal transport and increase output. Straight line flow is not always attainable but by means of research it may be approached as nearly as possible. Operatives do not always discover best method of performing an operation. By gradually educating them as to quickest and most economical movements, and by elimination of unnecessary motions, time may be saved. A further increase in output may be obtained by placing materials in the most easily accessible positions. By improving lighting, keeping temperature and humidity of air agreeable, using the right type of benches, and generally preventing unnecessary discomfort, operators may be induced to work faster without additional strain.—H. R. M. Thorp, *Chemical Age*, (British) Sept. 23, p. 274.

Plant Operation

Chrome Health Hazards

Continued expansion in use of chromium compounds in industry makes thorough knowledge of scientific protection to workers a vital necessity. Chromium poisoning usually affects skin and mucous membranes as follows: 1. Dermatitis (as a diffuse inflammation or in a vesicular or papular form); 2. "Chrome holes"—single or multiple ulcerations of the skin and subcutaneous tissues; 3. Irritation of the respiratory membranes, with nasal ulceration and perforation of the nasal septum. Preventive measures include segregation of workers so that only as few are exposed as possible; thorough ventilation (special apparatus is necessary); strict plant cleanliness; per-

sonal hygiene, including protective clothing, protective ointments; respirators and goggles; finally, strict medical supervision. *Protection Of Workers Exposed To Chromium And Its Compounds,* Industrial Health Section Bulletin, Metropolitan Life Insurance Co., N. Y. City.

New British Chemical Specification

British Standards Institution has issued its half-yearly handbook. Chemical Division has 16 technical committees and 14 sub-committees. Specification No. 334 for chemical lead is being revised, and will include lead to which alloys have been added. Specifications being prepared include scientific glassware, vegetable oils, solvents, and nickel anodes and chemicals used in electroplating. Chemical Engineering Section is considering containers for heavy acids, corrosives, and solvents, stoneware; and welded containers for liquifiable gases. British Standards Institution (Publication C. D. 800) 28 Victoria st., London, S. W. 1, Price 1s. 2d.

Chemical Divisional Council (British Standards Institution) has decided that in all British Standard Specifications prepared for use in chemical industry in which reference to metric units of volume is made, unit to be employed shall be the millilitre (abbreviation ml.) in preference to cubic centimetres.

Protective Paints for Tanks

White synthetic enamel, black graphite paint, and spar varnish aluminum paint were experimentally studied to determine temperature effect on contents of storage tanks and shipping drums. White paint which retains brightness and can be kept free from dirt is superior to both black and aluminum paints as a heat insulator from solar radiation. Advantage in typical summer weather in this climate is 3° F. as compared with aluminum, and about 8° F. as compared with black.

Containers painted with black cool rapidly. If total average heat content of tank is considered, low efficiency of black surface in heat reflection is, to some extent offset by high rate of heat loss during cooler portions of the day. Rapid cooling is due largely to high temperature difference which liquid attains during warmer portions of the day. White containers have low difference in temperature between liquid and environment during cool portions of the day and cool slowly. Lloyd R. Moses, *Paint, Oil and Chemical Review*, Oct. 5, p. 9.

Causes of Rust

German Research Institute for Textile Industry (Dresden) after exhaustive study on rust causes reports: 1. Rust formation on bright iron in the air originates from CO_2 contained by latter and is not caused by some or other catalytic process, as the general opinion runs. 2. Iron rusting as well as verdigris formation upon copper and alloys can be prevented by neutralization of the CO_2 of the air.

Electrical Insulating Specifications

A. S. T. M. (headquarters, 1315 Spruce st., Philadelphia) has just released publication containing all of the 32 A. S. T. M. specifications and tests covering electrical insulating materials. The 1933 report of Committee D-9 on electrical insulating materials is also included.

Chemical Uses of Rubber

Rubber Growers' Association (London) have just issued a 55 page booklet describing in great detail part played by rubber in chemical and allied process industries.

Tank Cleaning Rules

Recent death of 5 in Newark, N. J. tannery, when attempting to clean pit, points to necessity of strictly following rules laid down by John Roach (N. J. deputy labor commissioner):

"No employe should be permitted to enter a tank until its interior shall be purified by repeated washings, and then the employe should have a life line securely fastened to his person and a fellow employe on the outside should be in control of the line."

*See also patents given in other subdivisions, pages 425-432.

Heavy Chemicals

Stable Chrome Yellow

Chrome yellow often dulls to brownish shade. Water often "reddens" it when allowed to stand too long before drying. To produce chrome yellow fast to light following conditions are found necessary. Production of a purely monoclinic precipitate, presence of basic hydroxides, existence of substances absorbing ultra-violet and protecting against hydrolysis. In practice, following are the operating conditions necessary: purely monoclinic precipitate is obtained by employing solutions of mineral acid salts of lead at a concentration ranging from 1-5 to 1-30, and precipitating and washing at 60°-100° C. Further, part of sulfuric is replaced by aluminum sulfate and/or lead sulfate. These metals are precipitated in the form of hydroxides after complete precipitation of lead chromate. Chrome yellow to be dried at 60°-140° C. Wetting with hydrophobic substances, for preference with a solution of wax, is effected before final dry grinding to ensure against hydrolysis. Dr. Hans Wagner, *Farben Zeitung,* July, 1933.

Zinc Chloride Purity

Existence of commercial zinc chloride entirely free of oxychloride is doubted. Four samples of commercial material analyzed showed 2.02%, 1.74%, 2.80%, and 2.49% oxychloride respectively. Zinc chloride containing less than 1% does not exist. Suggestions for making clear zinc chloride solutions are: addition of ammonium chloride retards visible hydrolysis; solution remains clear at a lower concentration, but a definite limit cannot be given in this case also. It is erroneous to assume that ammonium chloride diminishes quantity of zinc oxychloride. A zinc chloride solution, after treatment with 20% ammonium chloride, contains as much oxychloride as before treatment. On fusion, content of zinc chloride in oxychloride increases to a degree roughly proportional to the duration of fusion, owing to the splitting off of hydrochloric acid. Most users dissolve their zinc chloride by treatment with steam. This does not increase the original content of oxychloride, but accelerates hydrolysis.

If a clear solution of zinc chloride is required, without addition of hydrochloric, following points should be observed: Concentration should be at least 43° Be.; treatment with steam should be avoided; ammonium chloride should be added; chloride should not be fused; water should be added to solid chloride with continuous agitation. Where hydrochloric can be used, quantity required is 1 gram of 22° Be. acid per gram of oxychloride present. In this case, solution by steam is without objection. V. Tabakoff, *"L'Industrie Chimique."*

Patents—Chemical*

Converting zinc oxide residues from organic nitro compounds into soluble salts. No. 1,931,220. R. V. Brown and R. O. Wood, to National Aniline & Chemical Co., N. Y.

Process for the production of nitrogen-hydrogen mixtures. No. 1,931,442. W. Klempt, Dortmund, Germany.

Method of producing hydrocyanic acid. No. 1,931,441. K. Keller, to Gess, Fur Kohlentechnik, Dortmund, Germany.

Process of making a crystalline sodium aluminate. No. 1,931,375. L. M. Clark and H. M. Spittle, to Imperial Chem. Industries, London.

Process of purifying technical crystalline sodium pyrosilicate hydrates. No. 1,931,364. M. C. Waddell, to Grasselli Chemical Co., Cleveland.

Process of calcining gypsum. No. 1,931,240. W. S. Randel and M. C. Dailey, to U. S. Gypsum Co., Chicago.

Process of making dihydroxyfluoranes. No. 1,931,049. Woods, Ogilvie and Kranz, to National Aniline & Chemical Co., N. Y.

Hydrolyzing alkyl sulfate esters in bauxite and water, for manufacture of alcohols and aluminum sulfate. No. 1,931,014. W. S. Wilson, to Merrimac Chemical Co., Boston.

Purifying treatment for hard water—phosphoric acid, ammonium hydroxide, and an alkaline earth. No. 1,930,885. G. Rittler, Stuttgart, Germany.

Highly concentrated nitric acid from dilute acid, nitrogen tetroxide and oxygen. No. 1,930,881. E. Luscher, Basel, to Lonza Electrical Firm, Basel and Gampel.

Nitrogen-containing compounds and process of preparing them. No. 1,930,876. H. Gruene and W. Eckert, Frankfort, to General Aniline Works, N. Y.

Complex aqueous solution of sodium chloride, for process of removing hydrogen sulfide from gases. No. 1,930,875. G. M. Ford and O. H. Schoenwald, Oklahoma.

A viscoid polymerization product of an alkylene oxide as a step in production of colloidal dispersions from certain insoluble solids and liquids. No. 1,930,853. L. Kollek and F. Pohl, Germany to I.G.F., Frankfort.

Lime, soda ash and aluminum chloride as mixing solution for treatment of liquids to separate resultant precipitates. No. 1,930,792. Wilson Evans, to National Aluminate Corp., Chicago.

Hydrochloric acid treatment of tricalcium phosphate for the simultaneous creation of dicalcium phosphate and of ammonium chloride. No. 1,930,744. L. Durepaire and B. Quanquin, France.

Process for recovering free chlorine from chlorides. No. 1,930,664. L. Rosenstein, to Shell Development Co., San Francisco.

Drying wet chlorine gas by use of water and contacting the result with sulfuric acid. No. 1,930,526. C. S. Lykes, to The Solvay Process Co., Solvay, N. Y.

Making water-soluble disinfectants, of aromatic compounds dissolved in fatty oils then treated with concentrated sulfuric acid. No. 1,930,474. P. Goedrich, Munich, to Goedrich Chemical Co., New York.

The production of hydrocyanic acid. No. 1,608,700 to B. S. Lacy, Red Bank, N. J. Disclaimer by assignee, Du Pont de Nemours & Co., Sept. 22, 1933.

Colloidal composition—aqueous ferric chloride and small amount of antimony. No. 1,930,448. R. H. Boundy and J. L. Amos, to The Dow Chemical Co.

Adhesive of oxidized drying oil and bitumen, for use in manufacture of abrasive products. No. 1,930,393. J. Lemerle, Paris, to Compagnie Centrale des Emeris.

Impression compound, elastic, of a nitrogenous colloid, soap, sodium borate and resin. No. 1,930,391. C. E. Kellner, Englewood, N. J.

Production of tri-sodium phosphate from comminuted ferrophosphorus and sodium carbonate containing chlorides and sulfates. No. 1,930,205. N. C. Lindberg, to Victor Chemical Works, Illinois.

Treating aqueous formic acid with n-propyl formate, for dehydration. No. 1,930,146. D. F. Othmer, to Eastman Kodak Co.

Replacing halogen atoms other than fluorine with fluorine, in the making of aliphatic fluoro compounds. No. 1,930,129. Midgely, Henne and McNary to Frigidaire Corp., Dayton.

Contact process for the manufacture of sulfuric anhydrode. No. 1,930,125. T. V. Fowler, Pelham, to General Chemical Co., N. Y.

Endothermic reactions in the removal of H or O groups from organic compounds. No. 1,930,053. A. O. Jaeger, to The Selden Co., Pittsburgh.

Amine hydrohalide manufacture, using volatile organic solvent. No. 1,929,950. Newton Lamb, to Dow Chemical Co.

Method of preparing aluminum oxide gel. No. 1,929,942. E. H. Barclay, to Silica Gel Corp.

Increasing excess alkalinity of Searles Lake brine by removing trona, as a borax m'fg process. No. 1,929,902. H. L. Robson, to Burnham Chem. Co., Westend, Cal.

Alkaline mercerizing liquor of a salt of an acid sulfuric ester of an aliphatic alcohol. No. 1,929,654. H. Schuette, Mannheim, to I.G.F., Frankfort.

For the removal of tannin from apple juice; retaining malic acid content. No. 1,929,642. F. A. Kormann, to Industrial Research Lab's., San Francisco.

Calcining sludges of alumina and iron oxide with an alkali metal carbonate, to produce alkali metal aluminates. No. 1,929,619. R. O. Wood, to Nat'l Aniline & Chemical Co., N. Y.

The hydrogenation of carbonaceous material by destructive action through a catalyst of molybdenum and alkaline iron oxide from bauxite. No. 1,929,528. H. I. Waterman, to De Bataafsche Petroleum Maatschappij, The Hague.

Decomposing titanium ores to convert them into alkali-metal titanate. No. 1,929,521. L. W. Ryan and J. R. Knoff, to Titanium Pigment Co., Inc., N. Y.

The treatment with a chlorinating medium, of sulfide materials containing iron, in the recovery of sulfur. No. 1,929,502. S. I. Levy and W. S. Millar (England) to Sulphide Corporation, N. Y.

Introducing trivalent manganese compound to precipitate impurities, and produce pure phosphate. No. 1,929,476. Charles F. Booth, Anniston, Ala. to Swann Research, Inc.

Process for obtaining acid metal phosphates. No. 1,929,452. R. L. Sebastian, Montclair, to The American Agri. Chem. Co.

Forming phosphoric acid from inorganic phosphate with method of converting this in dissolution into corresponding alkali metal phosphate. No. 1,929,443. C. H. Milligan, to The American Agri. Chem. Co.

Process for orthophosphoric acid and/or its conversion products, from materials containing inorganic phosphates. No. 1,929,441-2. C. H. Milligan, to American Agri. Chem. Co.

Method of purifying impure succinic acid and succinic anhydride. No. 1,929,381. A. O. Jaeger and F. P. Fiedler, to Selden Co., Pittsburgh.

Process for the preparation of ammonium perborate. No. 1,929,121. R. Seng, Germany, to E. I. du Pont & Co.

Treatment for bentonite, by washing and by hydrochloric and sulfuric acid action, before final washing and pulverizing. No. 1,929,113. J. D. Haseman, Linton, Ind.

Fluid for hydraulic braking, of ethylene glycol, water and sulfurated castor oil. No. 1,928,956. J. W. Tatter, to Lewis Differential Co., Chicago.

Process for glutamic acid hydrochloride and betaine acid sulfate from desaccharified waste liquors in beet-sugar manufacture. No. 1,928,840. R. Masuda, to The Larrowe-Suzuki Company, Detroit.

Concentration of nitric acid and dehydrating agent by vaporizing and use of second de-initrating column. No. 1,928,749. F. C. Zeisberg, to du Pont & Co.

The production of esters from vegetal fats and oils, using polyhydric aliphatic alcohol. No. 1,928,582. E. Wecker, Germany, to I.G.F., Frankfort.

Process for the manufacture of sodium bicarbonate. No. 1,928,540. Henri Lawarree, Brussels, Belgium.

Low temperature, hydrochloric acid-electrolyte-salt-solution process for freeing oils and fats of impurities. No. 1,928,531. W. Gensecke, Germany, to American Lurgi Corp., N. Y.

Hard tough, sintered composition with iron-aluminum binder, as cemented tantalum carbide. No. 1,928,453. Floyd C. Kelley, to General Electric Co., N. Y.

Sulfur recovery from iron sulfides by chlorination, vaporizing sulfur, producing hydrogen chloride from the ferric chloride, and returning the chlorine to the process. No. 1,928,406. R. F. Bacon, Bronxville, N. Y.

Processes for treating water solutions and for water purification,—removal of alcohols, amines & phosphoric esters from treatment by acyl halides. No. 1,928,399-400. O. M. Urbain, to C. H. Lewis, Harpster, Ohio.

Pure and mixed esters of the carbohydrates produced under pressure, in liquid sulfur dioxide. No. 1,928,269. Schmidt, Balle and Lange to I.G.F., Frankfort.

Production of ammonium sulfate by oxidizing sulfur dioxide in presence of soluble metal salt as catalyst. No. 1,928,266. L. Rosenstein, to Shell Development Co., Cal.

Method for cleaning drain pipes with caustic alkali and aluminum pellets. No. 1,928,226. E. T. Ladd, Niagara Falls, N. Y.

Mixture of sodium silicate and of alumina compounds to cause immediate gel formation, in the manufacture of silicate gel. No. 1,928,123. W. A Bruce, to The Permutit Co.

Process for porous articles of silica with solvent extraction of binder and soluble bodies from the molded mass. No. 1,928,021. George King, to Albright & Wilson, Ltd., Birmingham, Eng.

Catalyst for ammonia oxidation, of platinum and rhodium. No. 1,927,963. E. A. Taylor, to Grasselli Chemical Co., Cleveland.

Process of concentrating phosphate-bearing material by agitating in presence of naphthenic acid. No. 1,927,939. F. F. Johnston, to Phosphate Recovery Corp., N. Y.

Stale dry glue base containing casein, alkaline earth hydroxide and alkali metal compounds, as an adhesive. No. 1,927,927. H. V. Dunham, Bainbridge, N. Y.

Black powder, combustion rate retarded by a solution of a H. V., nondrying vegetable oil. No. 1,927,870. B. A. Gillie, to du Pont Company.

Heating lubricating distillates, dehydrating under reduced pressure, giving acid treatment together with centrifugal separation, with neutralizing treatment in regulated heat. No. 1,927,853. C. W. Stratford to Stratford Development Corp., Kansas City.

Refining of vegetal oils and fats; the step of heating to about 280° C. with up to 5% of weight in anhydrous boric acid. No. 1,927,850. M. Schellman & H. Franzen to I.G.F., Frankfort.

Process for separating elements of oxidation products from the destructive oxidation of solid hydrocarbons. No. 1,927,840. Martin Luther to I.G.F., Frankfort, Germany.

Explosive, of liquid organic nitric ester and an organic ester of phosphoric acid. No. 1,927,832. W. C. Holmes to E. I. du Pont & Co.

Converting high boiling hydrocarbons, oils, vaporizing in separate zones, heating to above 1000° F. and lowering by cool oil admixture. No. 1,927,829. A. E. Harnesberger & C. L. Smith to Gyro Process Co., Detroit.

Purifying or decolorizing organic acids, using phenolic and hydrocarbon solvents. No. 1,930,054. A. O. Jaeger and L. C. Daniels, to The Selden Co., Pittsburgh.

Manufacture of phenyl esters of phosphoric acid; the step of treating the crude ester with a water soluble permanganate. No. 1,931,056. Clemmenson, to Monsanto Chemical Co., St. Louis.

Process for simultaneous production of ethylene glycol & acetaldehyde by condensation of pressure vapors. No. 1,928,240. P. Askenasy and A. Heller, Karlsruhe, Germany.

Obtaining carbon black and a hydrogen-nitrogen gas mixture, in controlled proportions, using thermal dissociation of gases and vapors. No. 1,929,664. W. D. Wilcox, Lawrence, Kansas.

Formulae for urethane derivatives and process for their production. No. 1,927,858. H. Ulrich and P. Koerding, to I.G.F., Frankfort.

Process of producing a mixed ester of cellulose. No. 1,928,652. C. J. Malm & C. R. Fordyce, to Eastman Kodak Co.

Process for recovering acetic acid from wood distillation. No. 1,928,746. W. S. Wilson, to Merrimac Chemical Co., Boston.

Impregnating fiberboard with alcohol solution of an ammonia-forming salt and process for forming said salt throughout the board. No. 1,928,805. A. Winogradow, New York.

Mercerizing cellulose and soaking fibrous material with a solution of barium compound, in the process of making a battery paste extender for lead-acid cell electrodes. No. 1,929,357. James O. Johnstone, Hammond, Ind., to Chemical & Pigment Co.

Manufacture of crystalline menthol, from synthetic hydrogenation menthol. No. 1,930,411. J. W. Blagden, Essex, England.

Process of rejuvenating spent photographic developers for the recovery of bromide. No. 1,930,143. K. C. D. Hickman and W. J. Weyerts, to Eastman Kodak Co., Rochester.

Acid hardening fixing bath, with concentration of acetate ions and of boric acid. No. 1,930,140. R. S. Becker, to Eastman Kodak Co.

Method of making silver thiosulfate. No. 1,929,466. J. J. Bajda, South Orange, N. J.

Method for manufacture of lactose-containing material, converting milk sugar into the monohydrate form, without formation of a cake. No. 1,928,135. D. D. Peebles and P. D. V. Manning, California.

Fine Chemicals

Titanium Potassium Oxalate Process

Titanium potassium oxalate is produced in 3 stages in a new process as follows: 1st, formation of potassium meta-titanate; 2nd, direct solution of this in theoretical quantity of oxalic; 3rd, isolation of double salt from the aqueous solutions.

Caustic potash is dissolved in a little water and solution heated to 300° to 400° C. Titanic acid (uncalcined) is added to form potassium titanate. A vigorous reaction takes place immediately.

Mass is cooled on sheet metal. While cooling it is continuously stirred. It is then transferred to a muffle furnace and heated to 600°-650° C. for 1 hour. Higher temperatures must not be employed, as titanate melts at 700° C. The titanic acid is now combined with potash, and separates on hydrolysis with cold water in the form of alpha-titanic acid easily soluble in oxalic.

Grinding and simultaneous hydrolysis of the titanate is done in wet grinding drum-type mill. While grinding oxalic necessary for formation of the double salt is obtained in the form of a hot concentrated solution in an agitated pan lined with hard lead. Into this solution alkaline emulsion from the grainding mill is led with continuous agitation. In about 15 minutes titanic acid is dissolved with the formation of an almost clear solution of titanium potassium oxalate.

Solution is blown into a settling tank. Equipment is lined with hard lead, and provided with steam coils to prevent crystallization of the salt. From the settling tank there are 2 outlets at different heights. Perfectly clear solution in upper part is led to the

evaporation pan, while lower part of the solution reaches this pan after passage through a suction filter.

Evaporation pan is heated (with superheated steam) either by a jacket or by steam coils, and liquor concentrated to a density of about 1.5, after which it falls into a crystallization vessel, where it is continuously agitated. Stiff crystal broth is transferred, by gravity fall, through a stoneware suction filter, where it is separated from mother liquor. Drying is effected at as low a temperature as possible. Dr. Ludwig Sluckert, *Chemiker-Zeitung*, Vol. 76, '33, p. 754.

Solvents

Stability Tests of Trichlorethylene

Conflicting opinions exist as to stability of trichlorethylene. Investigation was carried out along 2 main lines which such decomposition may take—photochemical and thermal decomposition.

Trichlorethylene and related solvents (including carbon tetrachloride) are all decomposed to some extent by light, but in chlorinated ethanes and ethylenes, oxygen is necessary. With these last-mentioned, no decomposition has been found to take place either in oxygen in the dark or in the absence of oxygen in the light. While dry carbon tetrachloride tends to decompose directly, in the vapor phase, with formation of free chlorine, when irradiated by mercury-arc light, photochemical decomposition products of the chlorinated ethanes and ethylenes are more complicated. So far, 2 lines of decomposition seem to be indicated, one resulting in phosgene and hydrochloric, and other of dichloracetyl chloride. Both reactions occur on exposure to the light of a mercury-vapor lamp, while daylight has a similar, but not identical, effect. In water, dichloracetyl chloride decomposes with the formation of hydrochloric and dichloracetic acids. While phosgene, under influence of oxygen, moisture, and light, tends to form carbon dioxide and hydrochloric.

These acid products, if formed in sufficient quantity, would have a definitely corrosive effect on common metals. Influence of wave-length of light effecting decomposition has been shown to be of major importance, and experiments have indicated that trichlorethylene, for instance, tends to decompose slowly in presence of oxygen on exposure to light in colorless glass bottles, more rapidly in silica, vessels under the same conditions, but not at all in the dark, nor even in colored bottles.

Thermal stability of trichlorethylene was investigated by boiling it in glass and cast-iron vessels for periods from 55 to 110 hours. In iron, a 0.006 normal acidity was found to have been developed after 72 hours, but no acidity could be detected in the solvent boiled in glass vessels. Further, no acidity was developed on boiling in vessels of mild steel for 100 hours, even with an outside bath at 160° C.—some 80° C. above the boiling-point of pure trichlorethylene.

All tests were carried out on pure solvent: and since both thermal and photochemical decomposition of trichlorethylene are increased by oxygen, admixture of some suitable antoxidant as a stabilizer or inhibitor immediately suggested itself. Of all the stabilizers tried, only alkylamines, benzylamines, and diphenyl guanidine were without effect on the metal. Others actually increased corrosion, while diphenyl guanidine is quite useless in presence of water.—I. C. I. Research Laboratories' Contribution, *Chemical Trade Journal* (London), Sept. 29, p. 227.

Italian Synthetic Acetic Process

Lack of suitable forest reserves makes synthetic acetic production vital to Fascist Italian chemical program. Process used at Villadossola by Societa Italiana Prodotti Sintetici is summarized:

Acetylene made from calcium carbide is freed from impurities in washing towers passed through a gas meter and converted into acetaldehyde, in large vessels lined with ebonite. Hydration takes place in a dilute solution of sulfuric containing salts of mercury. Solution containing aldehyde and excess acetylene is recovered as an aqueous solution, from which pure aldehyde is obtained by distillation. Reaction, (most delicate part of the process) is closely controlled by mechanical systems which carry out necessary analyses automatically. Mercury salts are made in a special department, which also recovers mercury utilized in conversion.

Pure acetaldehyde is oxidized to acetic by oxygen gas in aluminum vessels. Oxygen is obtained by fractional distillation of liquid air by a double Claude plant of 100 cubic metres of oxygen per hour, situated in away from acetylene. From crude acetic there are produced grades ranging up to purest glacial for pharmaceuticals. Prof. F. Garelli, "I Progressi dell' Industria Chimica Italiana Nel I Decennio di Regime Fascista" (Associazione Italiana di Chimica).

Patents—Solvents

Process for the manufacture of halogenated alcohols. No. 1,931,204. H. Meerwein and E. Goth, Germany, to Winthrop Chemical Co., N. Y.

Method of isolating aryl-amino-ethanols and compound so obtained. No. 1,931,123. G. A. Alles, Monterey Park, Cal.

Dichlorethane solvent added to wax-containing mineral oil, cooling to precipitate wax, leaving a clear solvent-oil solution. No. 1,930,479. Leo D. Jones, to Sharples Specialty Co., Philadelphia.

Method of making tetrachlorethylene and hexachlorethane. No. 1,930,350. C. J. Strosacker and C. C. Schwegler, to The Dow Chemical Co.

The production of alkyl esters from olefines. No. 1,929,870. R. M. Isham and W. B. Pine, Oklahoma.

Commercial alcohol made non-corrosive by addition from the group—sodium carbonates, sodium acetate, sodium borate, sodium lactate and corresponding potassium salts. No. 1,927,842. F. A. McDermott to E. I. du Pont & Co.

Use of inorganic ammonium salt for high yield of acetone and butyl alcohol and low yield of ethyl alcohol, in manioc mash fermentation. No. 1,928,379. H. B. Hutchinson, to The Distillers' Company, Edinburgh.

Equipment Booklets

E32. The Brown Instrument Co., Philadelphia. Catalog No. 6702 is a new 80 page booklet, profusely illustrated, describing in great detail the new Brown Thermometer and Pressure Gauge line. (For more complete description see the New Equipment section, page 432.

E33. Cushman Chuck Co., Hartford, Conn. A new 12 page booklet describing the new Cushmatic "Pull-Push" Power Units electrically operated. (Bul. 127).

E34. Farrel-Birmingham Co., Ansonia, Conn. "Forestalling Labor Troubles" is No. 4 in a series of Booklet-editorials by Allen W. Rucker and N. W. Pickering, president, Farrel-Birmingham (heavy equipment of various kinds). A mighty interesting booklet for the production and plant manager and contains a number of thought-provoking ideas of immediate value. Even more interesting than the 3 preceding ones.

E35. Farrel-Birmingham Co. Bulletin No. 437 describes in detail the Farrel Gearflex Couplings. Complete engineering data are given.

E36. Fisher Scientific Co., 717 Forbes st., Pittsburgh. "The Laboratory," house organ of Fisher Scientific, features the story of Chinese alchemy. In addition the usual number of important scientific apparatus announcements are included.

E37. Ingersoll Steel & Disc Co., 310 S. Michigan ave., Chicago. A new 4 page booklet showing many new applications of Ingoclad stainless clad steel. Illustrations cover views of tanks, pressure vessels, autoclaves, evaporators, etc.

E38. Linde Air Products, 30 E. 42 st., N. Y. City. "The Principles of Bronze-Welding" (L-147). For those who would delve into the inner workings of a bronze-weld this pamphlet is beyond value. It is an authoritative paper on the technical and metallurgical aspects of the bronze-welding process, and as such should be of special interest to engineers and technical men, although metallurgically-minded executives, students, or welders, will find it equally informative.

E39. N. J. Zinc Co., 170 Front st., N. Y. City. Current issue of "The N.J. Zince Alloy Pot" gives the complete list of physical and chemical properties of Die Cast Zamak Alloys (alloys made from N. J. Zinc's Horse Head Special 99.99+% zinc.

E40. The Patterson Foundry & Machine Co., East Liverpool, Ohio. Company has just released 2 booklets; (1) descriptive literature on the new Patterson Unipower Agitator; (2) the Patterson High Tensity Magnetic Separator.

E41. Charles Ross & Son, 148-156 Classon ave., Brooklyn. Catalog No. 8C describes roller mills for printing ink, paints, lacquers, coatings, etc.

E42. Surface Combustion Corp., Toledo, Ohio. Latest in the monthly series of 4-page booklets describes SC direct gas-fired air heaters.

E43. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. A-62478 is a 4-page booklet describing a new fluid valve. Large or small volumes of compressed air, liquid mediums can be controlled accurately by the use of this electrically operated check valve.

E44. Westinghouse Electric & Mfg. Co. A-62477 is a revised 12-page circular which reviews gas electric sets for every application issued by Westinghouse.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets specify by number, viz. E35; E36; etc. .....

.....

Name.....

Title.....

Company .....

Address .....

Equip. Nov.

Plant Laboratory

Drying Agents Compared

Investigations of the suitability of various laboratory drying agents have been relatively few. Essential characteristics of ideal desiccating agent: (1) It should remove moisture rapidly, regularly, and completely; (2) it should be as stable as possible under ordinary atmospheric conditions; (3) it should show some indication when it has taken up so much water as to render it no longer usable; (4) it should be easy to handle; (5) it should preferably be easily reactivated.

Actual desiccating action is most important of the properties, and following agents are arranged in decreasing order, an approximate numerical value being provided by the pressure of the water vapor over it at room temperature:—

Calcium chloride	0.20m.m.
Sodium hydroxide (fused)	0.16m.m.
Potassium hydroxide (fused)	0.003m.m.
Alumina	0.0025m.m.
Concentrated sulfuric acid	0.0020m.m.
Barium oxide	0.0010m.m.
Silica gel	0.0010m.m.
Barium perchlorate	0.0010m.m.
Magnesium perchlorate	0.0005m.m.
Magnesium perchlorate ($+3H_2O$)	0.0003m.m.
Phosphorus pentoxide	0.0002m.m.

Figures emphasize relative inefficiency of sulfuric, and particularly of calcium chloride, and show phosphorus pentoxide to be the best drying agent, although there are several others which are almost as good.

Particular advantages of magnesium perchlorate are its freedom from stickiness and channeling associated with calcium chloride and phosphorus pentoxide when these absorb water. In addition, it remains porous, it does not attack cotton-wool plugs, and since it contracts in volume, it is easily removed from gas-drying U-tubes without possibility of breakage which is usual with phorphorus pentoxide. Its moisture absorption capacity is over 30% of its own weight, and it can be regenerated by heating at about 200° C. for 10 hours.

Freshly ignited barium oxide is another promising material which compares favorably with phosphorus pentoxide, although exact data are not available. There seem to be possibilities also with boric acid. *Chemical Trade Journal*, (London) Sept. 15, p. 198.

Coal Tar Chemicals

Synthetic Phenol Catalysts

Catalysts used in phenol synthesis by saponification of nonchlorbenzene in the vapor phase generally renew activity by oxidizing treatment—with air at an elevated temperature. *Chemiker-Zeitung*, Sept. 13, p. 725.

Creosote for Fuel

British Standards Institution has issued B. S. S. No. 503—specification for "Creosote For Fuel In Furnaces."

Oil should be free from organic acids sediment or other impurities likely to choke burners; Some grades covered by specification must have warm storage and heated pipe-lines. Specification includes requirements for physical properties of the material, such as specific gravity viscosity, water content, matter insoluble in benzol, fluidity, flashpoint, ash and calorific value. Details as to the method by which tests for determination of these requirements are to be carried out are given in appendices. Address—28 Victoria st., London, S. W. 1. Price 2s. 2d.

Patents—Coal Tar

Process for the manufacture of quinizarine green and the corresponding leuco derivatives. No. 1,931,264. W. C. Meuly, Milwaukee, to E. I. du Pont & Co.

Carrying out the condensation reaction in aqueous solution in preparing arylamino-anthraquinone bodies. No. 1,931,265. W. C. Meuly, to E. I. du Pont & Co.

Vat dyestuff for vegetable fiber fast shades. No. 1,931,196. Kalischcer, Ritter and Baumann, Frankfort, to General Aniline Works, N. Y.

Nitrogen-containing cyclic ketone, and its process. No. 1,931,192. H. Greune and H. Sieber, Frankfort, to General Aniline Works, N. Y.

1-amino-5-methoxy-benzo-thiazole. No. 1,931,077. H. A. Lubs and A. L. Fox, to E. I. du Pont & Co., Wilmington.

Process for preparing pyranthrone. No. 1,931,021. W. Dettwyler, to E. I. du Pont & Co.

The manufacture of tertiary alkylol-arylamines. No. 1,930,858. W. Muller, Leipzig, to General Aniline Works, N. Y.

Preparation of aqueous dispersions comprising a fatty substance and a certain salt of an aliphatic amine. No. 1,930,845. H. Ulrich and C. Schuster, Germany, to I.G.F., Frankfort.

Recovery of hydrochloride from the chloro-benzene chlorination of ortho-toluidine. No. 1,930,751. E. Havas and H. R. Lee, to E. I. du Pont & Co.

Chlorination process for preparing a para-chloro-arylamine of the benzene series. No. 1,930,754. E. Havas and H. R. Lee, to E. I. du Pont & Co.

Chlorination of cresidine. No. 1,930,753. E. Havas and H. R. Lee, to E. I. du Pont & Co.

Step in the process of chlorinating para-xylidene. No. 1,930,752. E. Havas and H. R. Lee, to E. I. du Pont & Co.

Catalytic oxidations of organic compounds. No. 1,930,716. A. O. Jaeger, to The Selden Co.

Glycerol condensation of impure anthraquinone to produce caustic alkali fusion products of bensanthrone. No. 1,930,681. A. O. Jaeger and L. C. Daniels, to Selden Co., Pittsburgh.

Priming mixtures based on heavy metal salts of tetrazene. No. 1,930,653. J. D. McNutt, to Winchester Repeating Arms Co., New Haven.

As a new compound; amylbenzoic acid, its process. No. 1,930,449. Bruson. Robinson and Stein, to Resinous Products & Chemical Co., Philadelphia.

For the preparation in liquid medium of anhydrous leuco vat dyestuffs. No. 1,930,409. Barnes, Harris, Wylan and Thomas, to Scottish Dyes, Ltd., Grangemouth.

Process of preparing 1.4-aminohydroxyanthraquinone. No. 1,930,352. C. Bamberger, Germany, to General Aniline Works, N. Y.

Formula for preparation of 1.4-diaminoanthraquinone. No. 1,930,351. C. Bamberger and P. Naeiasky, Germany, to General Aniline Works, N. Y.

Dyes from sulfuric ester of brominated pyranthrone series. No. 1,929,912. Barnes, Harris, Wylan and Thomas, to Scottish Dyes, Grangemouth, Scotland.

Vat dyestuffs, anthraquinone-naphthacridone series. No. 1,929,876. P. F. Bangham and R. F. Thomson, Grangemouth, Scotland, to Imperial Chem. Ind's.

Improved, aroylated dyestuffs and intermediates from the anthraquinone series. No. 1,929,875. Smith, Thornley and Thompson, Grangemouth, Scotland, to Imperial Chem. Ind's.

Production of sulfuric esters of anthraquinone and derivatives. No. 1,929,-866. D. A. W. Fairweather and J. Thomas, to Scottish Dyes, Limited, Grangemouth, Scotland.

The preparation of ortho-amino-carboxylic acid esters of the anthraquinone series. No. 1,929,863. K. Wilke, to General Aniline Works, N. Y.

Azo dyestuff from aromatic radical of the benzene or naphthalene series. No. 1,929,853. H. Reindel and H. Krzikalla, to General Aniline Works, N. Y.

Process for production of ketones, by using acetylene and a substance which ketonizes endothermically, from the group ethyl acetate, ethyl alcohol, acetaldehyde and acetic acid. No. 1,929,331. W. Querfurth, to Firma Roessler, Frankfort, Germany.

Priming mixture for ammunition containing a lead salt of dinitrosalicylic acid. No. 1,928,780. J. E. Burns, to Remington Arms Co., Bridgeport.

Process for making orthoarylcarboxyamidothioglycollic acids. No. 1,928,733. Muller, Luce and Schulte, Germany, to General Aniline Works, N. Y.

Anthraquinone wool dyestuffs, with shades of remarkable fastness and levelling property. No. 1,928,725. E. Honold and K. Weinand, to General Aniline Works, N. Y.

Complex vat cotton-dyestuffs, bordeaux-red to deep brown, of high fastness properties. No. 1,928,719. W. Eckert, Germany, to General Aniline Works, N. Y.

Steam distillation of ammoniacal liquor, with alkaline solution or suspension added to the residue, to produce pure ammonia. No. 1,928,510. F. W. Sperr, Jr., to The Koppers Co., Delaware.

Treating gas liquor by distillation, vaporizing ammonia and removing tar acid by contact with inert gas. No. 1,928,507. Joseph A. Shaw, to The Koppers Co., Delaware.

Treatment of ammoniacal gas liquor, freeing from tar acids and liberating ammonia by the steam. No. 1,928,495. D. L. Jacobson, to The Koppers Co.

A mercury derivative from nitro-meta-cresols. No. 1,928,436. G. W. Raiziss and L. W. Clements, to Abbott Laboratories, North Chicago.

Vat dyestuffs of the anthraquinone series, 2.6-bisphenylmercaptomethyl-iminoanthraquinone. No. 1,927,965. O. Unger and G. Boehner, to General Aniline Works, N. Y.

Process of preparing levo-1-phenyl-2-metnylamino-propanol-1, by means of dextro-tartaric acid. No. 1,927,961. F. Stolz and J. Hallensleben, to Winthrop Chemical Co., N. Y.

Problematic formula for nitro-hydroxybenzamide derivatives, valauble intermediates in dyestuff manufacture. No. 1,927,936. Hentrich, Stroebel, & Tietze, to General Aniline Works, N. Y.

Formulae and product for separation of vat dyestuffs isomers of the naphthoylene diarylimidazole series. No. 1,927,928. W. Eckert & H. Sieber, to General Aniline Works, N. Y.

Recovery of phenols from liquors by removing impurities and using alkaline reagent to remove the phenols. No. 1,927,883. W. B. Wingert, to Semet-Solvay Co., N. Y.

Process for the manufacture of non-dyeing sulferized phenol derivatives. No. 1,928,257. H. Leeman & V. Kartaschoff, to Chemical Works Sandoz, Basel, Switz.

Process for forming a diphenylol naphthene; 2 parts phenol, 1 part cyclic ketone in presence of acid catalyst. No. 1,929,209. W. H. Moss, to Celanese Corp.

Process of extracting phenols and substantially water insoluble ingredients of ring structure from oils containing same. No. 1,929,438. Ralph H. McKee, Jersey City.

Insulating compound, of the thermoplastic and electrical properties required for deep-sea cables; 40% rubber, 40% balata or gutta percha, small amount of diphenyl-ethylene-diamine. No. 1,930,274. A. R. Kemp and J. H. Ingmanson, to Bell Telephone Lab's, New York.

Addition of inorganic base before distillation, as step in refining of crude phenols. No. 1,931,057. E. Clemmenson and R. M. Miller, to Monsanto Chem. Co.

Heat with alkali metal salts, for derivatives from sulfurized phenol. No. 1,931,197. V. Kartaschoff, to Sandoz Chemical Works, Basel.

Process for producing hexamethylenetetramine from methane, nitrogen and oxygen. No. 1,930,210. Paul Nashan, Rhineland, to Gutehofnungshutte, Oberhausen, Germany.

Composition containing cellulose derivative and a diphenylol naphthene as plasticizer. No. 1,929,210. W. H. Moss, to Celanese Corp.

New Equipment

Checking Time Lost in Fuse Blow-outs

Westinghouse (East Pittsburgh, Pa.) has available a Fuse Check Book which makes it easy to obtain an accurate and permanent record of waste that may occur in a plant whenever a fuse blows. By itimizing facts on blown fuses over a short period, it is possible to evaluate the lost time of men and machines.

Light-weight Cutting Apparatus

Linde Air Products (30 E. 42 st., N. Y. City) has a new portable cutting machine weighing but 43 lbs. as an addition to its Oxweld line of apparatus. Known as the "Secator" machine combines portability of a blowpipe with the accuracy and finish of a cutting machine and makes it possible to do high-quality cutting anywhere in the shop or field.

Mercury Switches on Control Thermometers

Brown Instrument (Philadelphia) has introduced use of mercury switches to eliminate open make-and-break contacts controlled by the pen arm (automatic control thermometer). In new controller, every 6 seconds a motor-driven control table determines location of the pen on the chart in reference to the control setting, and tilts mercury switch from 1 side to the other if the temperature has changed. Controller also embodies many other distinct new advantages.

"Electric Eyes" For Safety and Fire Control

Westinghouse's J. V. Alfriend advocated use of "electric eyes" as safety devices in chemical plants for guarding workers from dangerous machinery, for providing adequate illumination and for detecting fires, at recent Chicago National Safety Council Meeting. "Light beams can be arranged to fall upon 'electric eyes' in the vicinity of machinery in such a way that when a worker approaches or enters the danger zone, he will interrupt a light ray, causing power to be shut off and brakes applied. In detecting fires, slightest wisp of smoke coming between source of light and the 'electric eye' is sufficient to cause ringing of an alarm or operation of a sprinkler system."

Copper Welded Acetic Storage Tank

Linde Air Products' October *Oxy-Acetylene Tips* reports construction of an unusually large fusion-welded copper tank for acetic acid storage, dimensions being: height—20′; diameter—10′; plate thickness—¼′. It was fabricated out of 4 copper sheets necessitating 1 girth seam, 1 longitudinal seam, and 2 end butt type seams. Copper fusion welding requires a copper completely free of oxides. This is now obtainable commercially.

Portable Electric Generating Units

Harnischfeger Sales Corp., Milwaukee, has a new line of portable electric generating units. Capacities range from 400 watts to 3 K.W. generating 35 or 120 volts direct current. Greater capacities are provided for by 4 or 6 cylinder gasoline generator sets with a current range of 1½ to 60 K.W. Diesel power is also available.

Pump for Corrosive Chemicals

Duriron Co., Dayton, offers a new small centrifugal pump for handling corrosive chemicals. It has a 1″ suction, 1″ discharge, and at 750 R.P.M. the head and capacity range from 2½ G.P.M. at a 25 ft. head, to 25 G.P.M. at 5 ft. head, with power consumption varying from approximately ¼ H.P. to less than ½H.P., these figures being based on water. It is available in either belt or direct motor drive, and has a closed-type impellor.

The pump, Model 2A is procurable in Duriron, (for general acid service) Durichlor, (for hydrochloric) Durimet (low-carbon nickel-chromium-silicon alloy steel for weak sulfuric at all temperatures) Durco Alloy Steel (low-carbon "18-8"—KA_2S and KA_2SMo), Alcumite (copper-aluminum-iron alloy for weak sulfuric), and in the chemical lead alloys.

Electrical Switch for Corrosive Atmospheres

G. E. has a new oil-immersed, magnetic switch, designed as CR 7006, for use in corrosive atmospheres where class I, Group D control is not required. Switch is designed for controlling motors which can be started on full voltage.

Efficient Dust-Guard Mask

A recently designed dust-guard mask has been placed on the market by Chicago Eye Shield Co., Chicago. New mask is claimed by its maker to be 99% plus efficient in the removal of floating dust from the air inhaled.

Mask consists of a soft, molded-rubber facepiece designed to adapt itself to any facial contour. When in position interior becomes sealed against outside air. Facepiece is held in position by a molded-rubber head harness fitted with detachable and adjustable buckles. Head harness requires one adjustment which by nature is permanent, but adjustment can be made.

Buckles consist of a male section permanently fastened to the facepiece; the female section is part of the buckle. The two pieces are joined by pressing together. It is said the mask can be slipped on or off the head in a few seconds.

Attached to the side of the face-piece is a molded, flexible, rubber tube permitting free movement of the head. The lower end of the tube connects with the air filter which in turn is attached to an adjustable belt. A quick-acting coupling connects the filter to the air supply. Air under pressure enters the filter passing through the filter cartridge where foreign particles and odors are removed. Volume of clean air carried to the facepiece is controlled by a valve. Excessive pressure is eliminated by an automatic relief valve.

Exhaled air is released through a one-way exhaust valve which prevents inhalation of air other than that delivered through the intake channel. In operation the facepiece is covered completely by an outer hood which is part of standard equipment. Large lenses and perforated metal screen permit wide vision.

Other Equipment Notes

A. O. Smith Corp., Milwaukee, is producing glass-coated storage tanks . . . Pyrene Mfg. Co., Newark, N. J., is introducing the Phomene Hopper, a machine in which water and Phomene powder are mixed together for discharge through a hose line and a continuous foam stream results . . . General Refractories, Philadelphia, suggests use of its Ritex chemically-bonded, unburned magnesite as a glass-tank checker brick . . . C. J. Tagliabue Mfg. Co., Brooklyn, is marketing a completely revised line of hydrometers.

Equipment Company Personnel

T. Shriver & Co., Harrison, N. J. manufacturer of filter presses, has appointed The Merrill Co., 343 Sansome st., San Francisco, as sales representative in Rocky Mountain and Pacific Coast. areas.

Duriron Appoints Managers

Duriron Co. has appointed E. D. Brauns, Philadelphia manager. He was formerly in charge at Boston. D. Augsburger, formerly at the plant at Dayton goes to Boston to fill vacancy made by Mr. Brauns' promotion.

Patents—Naval Stores

The production of water-soluble compounds of the abietene family. No. 1,931,257. C. O. Henke and M. Charlton, Milwaukee, to E. I. du Pont de Nemours & Co.

Rosin composition resistant to crystallization. No. 1,931,226. I. W. Humphrey, to Hercules Powder Co., Del.

Method of treating pine oil for the separation of borneol. No. 1,928,020. I. W. Humphrey, to Hercules Powder Co., Delaware.

Chemical Markets & News

Alliance and NRA Officials Dead-locked Over "Merit Clause"—Corn Processing Tax Affects the Chemical Industry—New Chilean Nitrate Law Near—Paint and Fertilizer Codes Approved.

Chemical Alliance and Assistant Administrator Williams remained deadlocked over the so-called "merit clause" in the chemical code. So despite almost complete agreement on all other provisions, it has been impossible to forward the Code to General Johnson for approval and from him to President Roosevelt for final signature. Most, if not all, of the companies who have signed the Chemical Alliance, have, however, complied with the wage and hour regulations laid down in the Code's provisions, thus indicating conclusively their desire to cooperate with the President in his attempt to solve the unemployment riddle.

Several of the larger companies have issued prepared statements. Monsanto's president, Edgar M. Queeny, in the recent issue of *Monsanto News* writes:

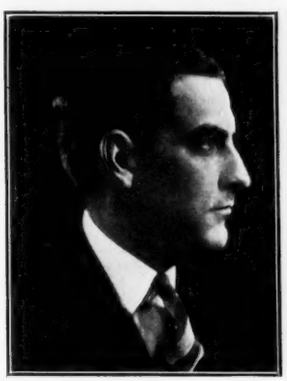
"Collectively and individually, we are concerned in the efforts of the Administration to promote the welfare of the American people. Inasmuch as the chemical industry is included in the activities of the NRA, those who have a special interest in Monsanto as stockholders, employes, or customers are entitled to know the Company's attitude toward and its participation in this gigantic program.

"In a bulletin to employes issued July 10, I stated: 'It will be the policy of this Company to cooperate fully with the Administration in putting into effect all the provisions of the National Recovery Act.' "

"This we have done, not only in letter but in spirit.

"President Roosevelt has requested that each company cooperate with others in its industry in the formulation of a code for that industry. The chemical industry has formed the Chemical Alliance, Inc., to deal solely with the problems of the industry under NRA. In this work, Monsanto has taken an active part. Charles Belknap, head of the Merrimac division, and myself are on the Board of Directors of the Alliance, and Mr. Belknap is a member of the Executive Committee. A code has been drawn up for the approval of the National Recovery Administration.

"Monsanto's wage rates compare favorably with those of the chemical and other



"These accomplishments have been made possible by adhering to an open shop policy."—Edgar M. Queeny

industries. The average hourly wage rate for each of the past 4 years has been greater than that of 1929. Our rates today are the highest in the history of the Company. Long before the conception of the NRA our working hours were reduced successively and voluntarily to spread the smaller amount of available work among the largest possible number of employes. Thus, both in the matter of hours of work and rates of pay, Monsanto's present standards exceed the requirements of the proposed chemical code.

"These accomplishments have been made possible by adhering to an open shop policy. Monsanto has operated on the open shop basis throughout its history and will continue to do so.

"Elaborating the thought expressed by President Roosevelt, I believe that no man who stands on the constructive side of his industry has anything to fear from the new order and that to such men, whether employers or employes, the opportunities for individual initiative and creative effort will be greater than ever."

Due to the fundamental differences of opinion over the "merit clause" modifying the collective bargaining provision it is very uncertain when the basic code of the industry will be ready. Chemical Alliance officers led by Cyanamid's William B. Bell and also members of the Executive Committee have been back and forth from Washington for the past month attempting to iron out the question. After an all-day session with General Williams on Oct. 20 a revised code was drafted and submitted. The Alliance's Code Committee has been informed by General Williams that when he approves the Code it may be circulated to the entire chemical industry before it goes to the President.

Code Hearings Scheduled

November 13

Earthenware Industry, Washington Hotel.

November 14

Asphalt Industry, Willard Hotel.

November 15

Textile Processing, Washington Hotel.

November 16

Carbon Black Manufacturing, Dept. of Commerce.

November 17

Corrugated and Solid Fiber Container Willard Hotel.

Mica Industry, Raleigh Hotel.

November 21

Talc and Soapstone, Willard Hotel.

Hogs, etc.,—Now Corn

A processing tax of 28c a bu. on corn was fixed by Secretary Wallace on Oct. 28, with the President's approval. On Nov. 5, date set for the tax to become operative, the Secretary of Agriculture, announced that the tax for November would be but 5c a bu. with a jump to 20c on Dec. 1. Lowering of tax was due to complaints registered by industrial and other users of corn products.

During the period of the 5c tax (the remainder of this month), the A. A. A. expects to develop compensatory taxes on products held competitive with corn so that those levies might be announced at the same time the full 20c tax becomes effective, it is understood.

With compensatory taxes in prospect for cane and beet sugar and starches such as tapioca, cassava, sago and arrowroot,

NO RESTRICTIONS ON USING THESE FACILITIES

THERE are no restrictions upon ingenuity in perfecting processes, in discovering more suitable raw materials, and in making fuller use of the latest chemical developments.

The Hercules Research Organization is aiding many companies to attain these ends. Although Hercules Products are now used in most industries, many industries could profitably use *more* of them. Hercules Laboratories develop new products for special purposes as they are needed; these research facilities are available to every business that seeks to bring its products or its processes into line with the improvements made possible by recent developments in industrial chemistry.

For more complete information about Hercules Products and Research Service write for a copy of "The Growth of a Modern Hercules".

Hercules Products Now Serve the Following Industries:

Textile, Paper, Construction, Celluloid and Plastic, Metallurgical, Disinfectant and Medicinal, Electrical Products, Dyestuffs, Paint, Varnish and Lacquer, Soap, Rayon and other Synthetic Fibres, Quarrying, Explosives, Laundry and Cleaning, Agricultural, Linoleum, Mining, Leather, Foundry, Ammunition.

Hercules Products: **NAVAL STORES:** Wood Rosins, Rosin Derivatives, Terpene Chemicals, Steam-distilled Wood Turpentine and Pine Oil. **CELLULOSE PRODUCTS:** Nitrocellulose. **CHEMICAL COTTON:** Bulk and Sheeted Chemical Cotton. **PAPER MAKING CHEMICALS:** Rosin Sizes, Coatings, Alum, Emulsion Oils, General Cleaners and Miscellaneous Paper Makers Chemicals. **GENERAL AND HEAVY CHEMICALS:** Nitric, Sulfuric, Muriatic Acid, Mixed Acids, Salt Cake, General Industrial Chemicals. **COMMERCIAL EXPLOSIVES:** High Explosives, Permissible Explosives, Black Blasting Powder, Detonators, Blasting Supplies. **SPORTING POWDERS:** RED DOT and other Shotgun Powders, Rifle and Pistol Powders.

IN-6

See these products at Hercules Booth No. 206 at the Chemical Show, New York, December 4-9

HERCULES POWDER COMPANY
INCORPORATED
WILMINGTON, DELAWARE

products which the country must necessarily import are to be faced with A. A. A. levies for 1st time despite vigorous protests of importers, who at public hearings minimized competitive situation between the starches and corn, the compensatory taxes are practically assured, according to authoritative sources.

Unless the A. A. A.'s sugar program is changed again, cane and beet sugar are to be taxed on the competitive grounds so that bounties or loans may be paid Continental producers.

Corn tax adjustment, according to the A. A. A., was made in consideration of testimony presented at a public hearing in Washington Nov. 2 and data obtained through investigations by the A. A. A.

"The testimony and data indicated that the full legal processing tax of 28c per bu. imposed on field corn or its products would cause a reduction in the consumption of corn and tend to build up a burdensome surplus," it was said.

Floor stocks of corn products held by processing establishments, wholesalers, and others, will be subject to the initial tax on its effective date.

A. A. A. exempts from the processing tax, corn processed by or for a farmer for consumption by his own family, employes, or household. Corn ground for feed purposes only also is exempt from the tax.

Corn products which will be taxed as floor stocks include corn meal, cornstarch, dextrins, glucose syrups and sugars, corn oil, corn gluten feed and corn gluten meal.

Equipment Makers Elect

Chemical Engineering Equipment Institute held its 1st annual meeting at the Chemists' Club (N. Y.) on Oct. 31 and elected the following officers to serve for

Dorr Co. head takes on still another "big job"

the next 12 months: president, J. V. N. Dorr, president of the Dorr Co.; vice-president, H. D. Miles, president, Buffalo Foundry & Machine; secretary-treasurer, D. H. Killeffer. Board of Directors include S. F. Spangler, Chemical Construction; P. C. Kingsbury, General Ceramics; D. W. Sowers, Sowers Mfg.; A. Lissauer, Louisville Drying Machinery; William E. Hall, Duriron; C. L. Campbell, E. B. Badger & Sons; H. E. LaBour, The LaBour Co.; James Moul, Turbo-Mixer; Arthur Wright, Wright Associates.

Code of the Institute has been signed by 33 members and has been forwarded to Washington. As yet no definite date has been assigned for either preliminary or formal hearings. The Institute is now engaged in a drive to increase the membership and all companies that are designers, producers, and erectors of chemical equipment are being urged to join. At the annual meeting a very modest budget was drawn up and its approval by the Executive Committee is momentarily expected. Steps have been taken to insure the small companies adequate voice in the framing of the Institute policies.

Chemical Engineering Equipment Institute is a member of the Machinery & Allied Products Institute. Through this the Institute is assured adequate and constant representation in Washington.

Foreign

Chilean Chamber of Deputies on Oct. 26 approved in principle the Government's bill to reorganize the nitrate industry. Bill now goes to Committee for revision into final form. This action was the final result of days of bitter debate over the bill, drafted by Finance Minister Gustavo Ross.

El Mercurio—leading Santiago newspaper—declared Oct. 18 editorially that the continual demands for financial aid by the Chilean nitrate industry on the Central Bank place the bank in a dangerous position in view of its depleted gold reserves. The bank recently was called on for a $10,000,000 advance to finance nitrate operations until a permanent reorganization is effected.

Congress is held to blame for the 2 months' delay in passing the nitrate reconstruction plan. Forecasting a new depreciation of Chilean currency, *El Mercurio* stated the opposition the Ross bill is meeting in Congress has plunged the industry into still greater difficulties than those encountered in the past. The paper demanded that party politics be dropped and that the problem be approached from a purely technical and commercial viewpoint.

Medley G. B. Whelpley, a Guggenheim partner and president of Cosach, published on Oct. 17 a statement firmly disclaiming that the Guggenheim interests were responsible for the unfavorable conditions attending the formation of the Cosach Nitrate Corp. when Anglo-Chilean Nitrate Co. and other American-owned concerns were linked in a $375,000 merger which included 50% participation by the Chilean Government.

Reviewing financial construction of the American nitrate companies in which the Guggenheim interests have important holdings, Mr. Whelpley refuted declarations made in Congress by opponents of

Medley G. B. Whelpley, Guggenheim representative, hotly refutes Santiago speculation charges

the bill and demanded that the matter be approached free of political considerations.

Mr. Whelpley's exposure of alleged misstatements and his plea for a sane consideration of the nitrate problem in Chile have made an excellent impression in responsible Chilean circles, it is reported in Santiago press despatches, which are impatient at attacks on foreign interests by political groups opposed to the government. Government quarters express confidence that the nitrate bill will soon pass.

Alleged speculation by Guggenheim Brothers in their holdings in Anglo-Chilean Nitrate and Lautaro Nitrate, later incorporated as Cosach, was emphatically denied in an additional statement by Mr. Whelpley on Oct. 29.

German Nitrogen Prices?

Annual issuance of German nitrogen syndicate's new price schedule for effect from July 1, 1933 to June 30, 1934, has been delayed this year pending government investigation of fair prices to be charged the farmer. This is the 1st time that the German Government has exercised direct authority in supervising prices in the nitrogen industry which, unlike the potash industry, is not under special legal regulation as is provided for in the Federal Potash Law. German Government's supervision of nitrogen prices this year may be interpreted as resulting from powers granted to the so-called "Federal Estates" (Reichsstaende) set up by the Hitler Government with similar authority to that vested in such emergency agencies in the U. S. as the NRA and the A.A.A. Pending release of 1933-34 prices, German Nitrogen Syndicate is quoting last year's prices, anticipating adjustments later, if the new price schedule is changed.

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A Stauffer Product will meet your most exacting demands for uniform quality and highest commercial purity. You will recognize the advantages in Stauffer Borax and Boric Acid, U.S.P., refined. Let us quote on your Borax or Boric Acid requirements. You will find that Stauffer, a dependable source of supply, can give the needed service at the proper time.

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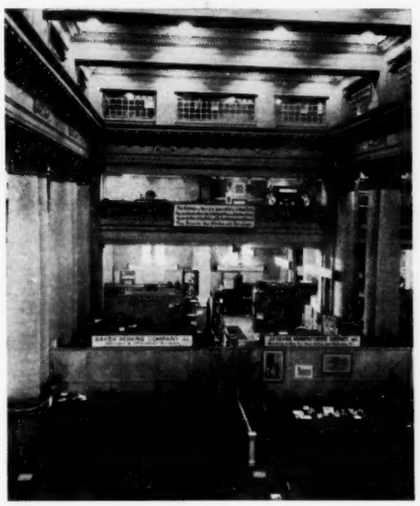
Great Britain's Loss

Great Britain recently has lost a number of outstanding men of the chemical industry through death. Included in the group were William Bottomly, for many years chief engineer for I. C. I. at Widnes; R. M. Hughes, chairman of Imperial Chemical Industries, Ltd., (India); J. B. Orr, founder of the lithopone industry; T. W. Stuart, general manager for Scotland for United Alkali from 1905 to 1926 and before the formation of that company he was works manager for C. Tennant & Sons; and finally, Frank Greville Williams, for years an outstanding chemist in the British dyestuffs industry. He was the son of Greville Williams, who in the early '60s served Sir William Perkins as an assistant.

The 17th Annual Meeting of the Association of British Chemical Manufacturers was held in London Oct. 12.

"Show Week"

The 14th Exposition of Chemical Industries, which will be held at Grand Central Palace, in N. Y. City, is now only a few weeks away. Actual dates are Dec. 4-9, inclusive. Number of exhibitors, at this



Grand Central Palace, N. Y. City—again the show place of the chemical advances of the past 2 years.

time in advance of the Exposition, is already greater than in previous years. Audience attendance seems bound to establish a new high record, and this not only because the Exposition is longer established—it has constantly increased its attendance figures. There is another factor, this year, and that is the reawakened and concentrated industrial interest, and the desire of everyone, in every line, to take advantage of unusual opportunities to acquire information not otherwise available.

Last Exposition of Chemical Industries was held in 1931, and after the next 1, this December, there will not be another exposition until 1935. It is for the combination reason, embodying results and uniqueness, that each exposition of chemical industries becomes the marketing high-point in the graph of industrial progress in the chemical industries. It reviews 2 years past and indicates development for 2 years forward. Thus its sphere of interest could be reckoned as 4 years, as well as 2. Record of the total chemical industry in U. S. has been predicted and proved by the record of these expositions which have now been presented under the same auspices, sponsorship, and direction, since 1915.

AT THE EXPOSITION

CHEMICAL INDUSTRIES cordially invites its readers to stop at Booth 28 on the Ground Floor of the Chemical Exposition. This year a most interesting and instructive exhibit will be shown—a wide variety of the new chemicals "introduced into society" since the last Chemical Exposition.

Washington

Presidential approval of codes moved at a much faster pace in the last 2 weeks of October. On Oct. 31 President Roosevelt affixed his signature to 7, including the fertilizer and the paint codes, and on Nov. 3 approval was won by 10 more, including asbestos, bottle caps, rock crusher manufacturing, fabricated metal products, soap and glycerine manufacturing, steel casting, petroleum equipment and copper and brass mill products.

NRA organization was given a shake-up Oct. 26; also a compliance division, an import division, and a trade association division were created.

Under the new set-up 4 division administrators will take charge of the 4 major industry divisions. Each division administrator will be assisted by several deputy administrators and a complete staff. Compliance division will, of course, handle complaints arising over alleged code violations. Import division will investigate complaints where it is alleged that foreign goods are endangering success of codes by very low prices.

Main 4 divisions are defined and have the following personnel:

Division 1. Extractive industries (metals coal) also automobiles, shipping, and related industries. Division administrator, K. N. Simpson; deputy administrators, W. H. Davis, Philip C. Kemp, K. J. Ammerman, L. H. Peebles.

Division 2. Construction and machinery, including lumber and metal products. Division administrator, Malcom Muir; deputy administrators, Tom Glasslow; H. O. King, Malcom Pirnie.

Division 3. Chemicals, leather, and other manufactures. Division administrator, C. C. Williams; deputy administrators, R. B. Paddock, W. W. Pickard, R. S. Conkling.

Division 4. Trades and services, textiles and clothing. Division administrator, Arthur D. Whiteside; deputy administrators, Dr. E. D. Howard, Dr. Lindsay Rogers, J. B. Dickey.

NRA was empowered Oct. 26 by the President to make preliminary investigations, to receive complaints from interested parties, and to make recommendations to the President in cases of alleged dangerously low prices of imported items. On the basis of these recommendations, the President may dismiss the complaint or may direct the United States Tariff Commission to make an investigation. Such hearing as the President may designate will also be held. On the basis of facts disclosed in the Tariff Commission investigation and at the hearings, the President will take such action as seems to him necessary to safeguard the codified industries.

NRA will be the court of 1st resort under the administrative set-up. To assist him in the administration of these import provisions, NRA Administrator Johnson has announced appointment of Oscar B. Ryder, formerly assistant chief of the economics division of the Tariff Commission, as chief of the NRA imports division.

"Swope Plan"

The general Washington reaction to the so-called "Swope Plan" brain-child of the brilliant G. E. president, was quite favorable. Plan, originally suggested 3 years ago as a depression cure, is based largely on economic planning and co-operation through trade associations. At the head would be a national association which would be perhaps consolidation of the U. S. Chamber of Commerce and the National Association of Manufacturers with the government adequately represented. Plan was advanced at this time because it is quite apparent that there is an ever increasing demand for protection against bureaucracy creeping into code enforcement. Plan in principle was approved by General Johnson, Henry I. Harriman, president of the U. S. Chamber of Commerce and others.

Mr. Swope's plan was put forward on the heels of a meeting Oct. 31 of 26 national associations of manufacturers which passed a resolution to cooperate with the National Association of Manufacturers "to secure more unified action by industry in the interests of the whole people in support of basically sound governmental policies and in constructive co-operation" with the government. In taking this action the group declared that the government was tending to district

the country for administrative purposes and threatening elimination of industrial self-government.

Group included the M. C. A., Synthetic Organic Chemical Manufacturers Association, Association of American Soap and Glycerin Manufacturers, Glass Container Association, Lead Industries Association, N. F. A., and National Lime Association.

A dissenting note against the Swope Plan was heard in the person of Robert L. Lund, president of the National Association of Manufacturers. He questioned in a statement the effectiveness of the Plan. It will be considered, however, at the annual convention in December.

Other outstanding shift in NRA policies was the decision of the Government to rotate Industrial Advisory Board members every 4 months. Pierre S. du Pont, chairman of the du Pont Co., is in the new group selected.

NRA Labor Advisors

Dr. Edward C. Eckel and John O'Donnell are labor advisors for the feldspar grinders industry . . . Dr. Eckel is also labor advisor to the asbestos manufacturing, buffing and polishing composition, buff and polishing wheel, grinding wheel, match manufacturing, and oxy-acetylene industries.

Association News

New Chemical Industry Medal of the American Section of the Society of Chemical Industry, which takes the place of the Grasselli Medal now discontinued, was presented Nov. 3 to James G. Vail, Philadelphia Quartz vice-president and chemical director.

Phila. Quartz's silicates authority 1st to receive brand new "Chemical Industry Medal"

New medal is to be awarded annually to a person who has made a valuable application of chemical research to industry, primary consideration to be given to applications in the public interest. Meeting was held jointly with the American Chemical Society, the Electrochemical Society, and the Societe de Chimie Industrielle.

Award went to Mr. Vail for his work on sodium silicates, on the subject of which he is recognized as a leading authority. Dr. Walter T. Taggart, University of Pennsylvania, described Mr. Vail's work, while the presentation of the medal was made by Professor Marston T. Bogert of Columbia University.

Mr. Vail, in his response to the presentation, delivered an address on the subject of waterglass, entitled "The Culture of Certain Silicate Gardens."

Mr. Vail studied at the Technische Hochschule at Darmstadt, University of Pennsylvania and Harvard University.

Getting To Be A Habit

Columbia's Dr. Colin G. Fink, has been elected to receive the Perkin Medal of the Society of Chemical Industry for 1934. Medal is awarded annually for valuable work in applied chemistry and will be presented this year to Dr. Fink for his inventions in the fields of metallurgy and electrochemistry. The selection is made by a committee representative of 5 of the national chemical societies. Last month Dr. Fink received the Acheson Award ($1,000 and a gold medal) at the Chicago meeting of the Electrochemical Society. He startled fellow electrochemists by announcing income would be set aside to help needy young scientists on electrochemical research. Presentation of the Perkin medal will be made at a meeting in New York early in January.

For Young Scientists

To bring younger chemists and chemical engineers interested in industrial chemistry into touch with the work of the Society of Chemical Industry, a new form of Associate Membership has been established which is very similar to the Junior Membership in other societies. To be eligible for Associate Membership, applicant must be under 23 years of age. His Associate Membership automatically terminates the end of the year in which he reaches 23 years of age. Subscription for Associate Members is 7s. 6d. ($1.90) per year, payable directly to the General Secretary in London or to the local section secretary (305 Washington st., Brooklyn, N. Y.)

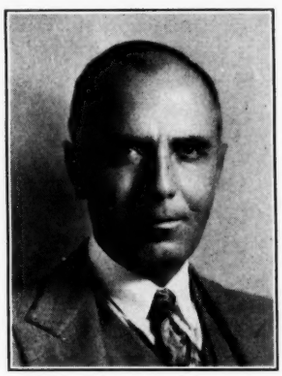
Healthy Growth

A. C. S. Delaware Section opened fall activities Oct. 18. Twenty-eight new members have joined, making total membership 326 as compared with 298 for last year. Increase is largely due to transfer of chemists from outside plants to plants within the territory of the Delaware Section.

American Institute held Nov. 3 a symposium on the proposed "Food and Drugs Act" initiated by Dr. Rexford Guy Tugwell. About 500 members and representatives from all of the large advertising agencies and food processing industries were present. Dr. H. C. Sherman, Chief Executive of the Department of Chemistry, Columbia, presided.

Personal

Harry L. Derby, President, American Cyanamid & Chemical, has become a member of the Executive Committee of the Family Welfare Committee's campaign to raise $4,000,000 to help N. Y. City's family relief agencies.



Will again lead industry's efforts to help the unfortunate

Mr. Derby, as chairman and J. L. Schroeder, as vice-chairman, of the Chemical and Paints Group of the Gibson Committee, with the assistance of a committee of 22 leading representatives of the industries, last year raised $117,000 for unemployment relief. Work of soliciting the industry was carried on with such vigor and success that they were asked by the Family Welfare Committee to act in the same capacity this year.

Money sought by this newly formed committee will go to family welfare societies of the city to aid them in extending special relief to depression-shocked men and women. These private relief agencies, helping to solve individual problems perform a needed service beyond that provided by governmental relief programs.

"It is a great privilege and honor to be associated with the Family Welfare Committee in its effort to elleviate the distress which is still prevalent in this 1st year of recovery," said Mr. Derby. "I feel certain that we will be able to enlist the same vigorous support that was given the Gibson Committee last year. We hope to raise our share of the amount sought."

Mr. Derby's Chemical and Paints Committee is 1 of the 80 in the Division of Commerce and Industry organized along similar lines to the work of the Gibson Committee. It is planned to devote $4,000,000 raised to the extraordinary activities of the private relief agencies during the coming winter.

A Job Well-Done

Charles H. MacDowell has ended his N. F. A. services with the return of Secretary Brand to full-time services after the latter's resignation as co-administrator of the A. A. A. When President Roosevelt and Secretary Wallace "drafted" Mr. Brand early this year to help organize the A. A. A. Mr. MacDowell came out of retirement to help N. F. A. draft an industry code.

Former Armour Fertilizer Head looks forward to a "round-world" cruise

Mr. MacDowell resigned as president, Armour Fertilizer, and vice-president, Armour & Co. on Jan. 16, 1932 after nearly 45 years of service. In 1893 he was placed in charge of the Armour exhibit at the Columbian Exposition at Chicago. Impressed with the agricultural exhibits showing the benefits derived from the use of fertilizer he wrote a letter to P. D. Armour asking permission to start a fertilizer division. In '94 "P. D.'s 'O. K.'" marked the beginnings of Armour Fertilizer. He also planned 1st Armour soap works. He has been an outstanding leader in the industry and in the N. F. A. and is an honorary member of the latter. Mr. MacDowell plans a round-the-world cruise.

Novel, Unique, Successful

U. S. I.'s progressive advertising manager, Leslie S. Gillette, is author of "This Company Advertises It's Competitors' Products," appearing in recent *Printers' Ink*. He reports success of novel "Solvent News" wherein not the merchandise, but what can be done with it, is the main theme. Says Mr. Gillette "Whatever form our advertising takes, it will stick closely to basic principle—to tell the customer, not the things we are interested in, but the things he is interested in; the things that will help him become constantly a better customer of ours. "That, as we see it, is what our advertising is for."

Medalists

Dr. Edward Weston, chairman and founder, Weston Electrical Instrument, is winner of the Lamme Medal. Dr. Weston is also a chemist and was Perkin Medalist in 1915.

John Fritz Gold Medal (highest of American engineering honors) was awarded pothumously to the late John Ripley Freeman, best known for his water-works engineering. Award is given jointly by 4 leading engineering societies.

Dr. Henry Drysdale Dakin is 2nd recipient of the Conne Medal awarded by the Chemists' Club (N. Y.) under endowment of Mrs. Madelyn Conne.

Metz Again Serves

General Herman A. Metz, President of H. A. Metz & Co., has once more consented to serve this year as Chairman, Drugs, Chemicals and Dye Stuffs Auxiliary, United Hospital Fund appeal.

As it has done for so many years, Fund will again distribute its income on 1 basis only—amount of free service rendered to the poor by each of its 56 member hospitals in N. Y. City. Last year Drugs, Chemicals and Dyestuffs Auxiliary collected $2,268 for the Fund.

Recovered

B. L. Soberski, N. Y. City wood flour importer, has completely recovered from an organic ailment.

The "Passing Review"

Carroll Dunham Smith is chairman of the drug and chemical industry section, Red Cross Drive, Nov. 11-30. Contributions should be sent to him at 317 E. 34 st., N. Y. City . . . F. C. Whitmore, dean at Penn State, spoke before the North Carolina A. C. S. section, Oct. 27 on researches in aliphatic chemistry which have been carried on under his direction. His speaking dates include Mount Holyoke, Nov. 18, N. Y. City, A. C. S. section, Dec. 8, Cornell, Dec. 28, A. A. A. S. Meeting at Boston, Dec. 29, and Virginia A. C. S. section Jan. 12 . . . Barnsdall's purchasing agent, O. McClatchey, is chairman, National Association's Oil Purchaser Group . . . W. L. James, Stanolind Oil & Gas is president, Purchasing Agents Association of Tulsa . . . L. C. Hughes, consultant on alkali and salt, sailed Oct. 14 for the Argentine for six months development survey . . . H. B. Pearson, president, Compressed Industrial Gases, succeeds E. J. Hayden, Linde Air Products, as president, International Acetylene Association . . . William R. Hainsworth, research director, Electrolux Refrigeration Laboratories, received annual Charles A. Monroe award, (for outstanding achievement in gas industry).

Fine to Heavy Chemicals

Adolph G. Rosengarten is on Penn Salt Board of directors . . . Ernest Mahler, Kimberly-Clark vice-president, is the recipient of the TAPPI medal . . . American Zinc Oxide's sales manager, A. C. Eide, sailed Oct. 13 for England . . . C. E. K. Mees, Eastman Kodak, spoke before the Rochester A. C. S. section Nov. 6 . . . Gustavus J. Esselen delivered an address "Before Papyrus-Beyond Rayon" in the Franklin Institute Lecture series on Oct. 26. . . . A. E. Dunstan, Anglo-Persian Oil chief chemist and an outstanding figure in petroleum technology, was guest of honor Oct. 25 at a Chicago Chemists' Club luncheon presided over by President Gustav Egloff . . . Selah S. Tomkins, Consolidated Gas' (N. Y. City) assistant chief chemist, received the Beal Medal, conferred by American Gas Association for best technical paper . . . Richard F. Hoyt, Mathieson Alkali director, is a vice-president, Haystone Securities Corp. . . . S. H. Clark, president Whitaker, Clark & Daniels, is completely recovered and back at his desk . . . Victor Chemical's, general manager, O. H. Raschke, was in N. Y. City early in October.

COMING EVENTS

National Fertilizer Association, Atlanta Meeting, Biltmore Hotel, Nov. 13-15.

Master Photo Finishers of Am. & Photo Finishers Institute of Am., Cincinnati, Nov. 13-17.

Purchasing Agents Association of N. Y., Members Exhibit, Hotel Pennsylvania, Nov. 21.

American Physical Society, University of Cincinnati, Dec. 1-2.

American Society of Mechanical Engineers, N. Y. City, Dec. 4-9.

Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 4-9.

American Society of Refrigerating Engineers Annual Meeting, Hotel New Yorker, N. Y. City, Dec. 7.

American Association of Textile Chemists & Colorists, Annual Meeting with N. Y. Section, Dec. 8.

Synthetic Organic Chemical Manufacturers' Association, Chemists' Club, N. Y. City, Dec. 8.

National Association of Insecticides and Disinfectant Mfrs., Hotel New Yorker, N. Y. City, Dec. 11-13.

American Institute of Chemical Engineers, Fall Meeting, Roanoke, Va., Dec. 12-14.

Society of Rheology, Pittsburgh, Dec. 27-28.

Fifth National Organic Chemistry Symposium, Cornell, Dec. 28-30.

American Association for Advancement of Science, Section C, Boston, Dec. 27, 1933-Jan. 2, 1934.

American Ceramic Society, Cincinnati, Feb. 11-16, 1934.

International Society of Master Painters & Decorators, Waldorf Astoria, N. Y. City, Feb. 6-9, 1934.

Technical Association of the Pulp & Paper Industry, N. Y. City, Feb. 19-22, 1934.

British Industries Fair, White City, London, Feb. 19-March 2, 1934.

American Management Association, 4th Annual Packaging Exposition, Hotel Astor, N. Y. City, March 13-17, 1934.

A. C. S. 87th Meeting, St. Petersburg, Fla., week of March 25, 1934.

American Drug Mfrs. Association, Greenbrier, White Sulphur Springs, week of Apr. 16, 1934.

A. C. S. 12th Midwest Regional Meeting, Hotel Muehlebach, Kansas City, Mo., May 3-5, 1934.

Ninth International Congress of Pure and Applied Science, Madrid, Spain, June 10-17.

LOCAL*

Nov. 13. St. Louis Section, A. C. S., St. Louis University School of Medicine.

Nov. 14. Western N. Y. A. C. S., Buffalo.

Nov. 15. Franklin Institute Lectures, Philadelphia; also Nov. 23 & Dec. 7.

Nov. 17. Detroit Section, American Society of Refrigerating Engineers.

Nov. 20. Rochester A. C. S. Section.

Nov. 23. N. Y. Section, American Society of Refrigerating Engineers.

Dec. 4. Rochester A. C. S., Section.

Dec. 8. N. Y. City Section, A. C. S., annual meeting.*

*Chemists' Club. (N. Y.)

Employment Curve Rises

A. F. L.'s William Green reported Oct. 22 that since the inauguration of President Roosevelt U. S. army of unemployed has been reduced by 3,600,000. Of these, according to Mr. Green, 1,700,000 have been rehired as a result of NRA. September gain was the largest since the administration began its attack on unemployment. Preliminary reports for October are not so encouraging.

Chemicals and related products factory employment increased 7.2% during September. Employment during month was 30.7% above level of September, 1932. Payroll totals increased more than 4.5% from the preceding month and exceeded those for September, 1932, by 24.7%.

Employment

	Sept., 1933	*Aug., 1933*	*Sept., 1932*
Chemicals	118.6	113.6	82.3
Cottonseed, oil, cake, and meal	54.4	37.3	46.3
Druggists' preparations	76.9	71.7	69.7
Explosives	103.8	91.3	71.6
Fertilizers	65.2	50.9	42.5
Paints and varnishes	80.4	80.0	66.9
Petroleum refining	70.0	66.0	63.4
Rayon and related products	196.7	188.3	130.9
Soap	116.0	110.9	94.5

Payroll Totals

	Sept., 1933	*Aug., 1933*	*Sept., 1932*
Chemicals	81.8	82.2	58.5
Cottonseed, oil, cake, and meal	49.8	36.0	40.3
Druggists' preparations	75.4	71.5	68.1
Explosives	71.7	67.8	44.8
Fertilizers	42.5	32.6	29.6
Paints and varnishes	59.2	60.2	51.6
Petroleum refining	57.6	55.0	54.6
Rayon and related products	168.3	156.3	110.8
Soap	91.9	86.0	83.3

Personnel

U. S. I.'s Ellis D. Slater, general sales manager and a vice-president, also vice-president of subsidiary, U. S. I. Alcohol Sales, returns to the reborn liquor industry as vice-president of Frankfort Distillery. He will also have the additional duty of directing sales in the East.

Mr. Slater entered the alcohol industry as a salesman in the Chicago Office, later being appointed Boston division manager. In 1927, he was transferred to the main office as assistant to the vice-president and was later assigned as sales manager and subsequently general sales manager.

Another outstanding figure in the industrial alcohol field, Dr. Louis H. Marks, secretary, Industrial Alcohol Institute. has entered the liquor industry. He is with Continental Distilling, Phailadelphia Dr. Marks is president of the Chemist's Club (N. Y.) and was largely instrumental for the complete renovation of the entire Chemists' Club building a few years ago.* Dr. Marks is recognized as an authority on European cartel systems and has written several articles for CHEMICAL INDUSTRIES in the past on various phases of this subject.

Harry E. Dunning, former American Commercial Alcohol's western division sales manager (since July 1), has been made general sales manager with offices in N. Y. City. He has spent practically his entire business career with American Commercial Alcohol and its predecessor, American Distilling. Following death of the late Albert Opper, vice-president, last June Mr. Dunning was placed in charge of mid-west sales.

New Koppers' President

John T. Tierney, formerly a Koppers Co. vice-president, is now president, succeeding H. B. Rust who is now board chairman.

Glyco Appoints

William A. Kingman, formerly chief chemist, Dennison Mfg., and later chemist for Lowe Paper, has established headquarters at Framingham, Mass., and will act as a special sales representative for Glyco Products, servicing special water-soluble waxes, resins, solvents, emulsifying agents, etc.

In New Fields

Karl Korpi has resigned from Socony Vacuum's research to continue studies in organic chemistry . . . R. W. Work is now chemist in G. E.'s Pittsfield plant . . . Frank Kerze, former with U. S. Rubber, is now with Barrett . . . Arthur D. Camp, formerly with National Carbon, is with Thomas & Hockwalt Laboratories in Dayton . . . Diamond Alkali's former chief engineer, M. Funder, is consulting on chlorine and alkali at 331 Madison ave., N. Y. City . . . W. J. Baeza, director, of Industrial Research, is also technical director for National Guarantors . . . R. L. Copson, formerly with Vacuum Oil, is in charge of the Tennessee Valley Authority's Knoxville Laboratories . . . Roy Heaton and P. E. Howard, formerly statistician with Fixed Nitrogen Research Laboratory, are now on Dr. Harry A. Curtis' TVA staff . . . E. B. Auerbach (former Berlin Chemical Society president) is with Keith Dunham . . . P. C. Frayser, former president, Mound City Paint & Color, is new Manistee Salt Wks. general manager . . . M. F. Bridges is purchasing for Tidal Co., Tulsa . . . Naugatuck Chemical's president, Elmer Roberts, is now also a U. S. Rubber vice-president.

Customs and Tariffs

Custom collectors have been instructed by the Treasury to proceed with appraisement of ferro-manganese from Canada without regard to any question of dumping. Investigation of complaints has produced no evidence to warrant a finding, according to Assistant Secretary of the Treasury. Appraisements have been withheld while the probe has been under way and imports have been permitted only under special bond.

Protests by Gulf Gypsum, a U. S. concern, against free entry of gypsum rock has been overruled by Customs Court for lack of prosecution.

Importations of Jap calcium carbide have been cleared of suspected dumping in an announcement by Secretary Woodin.

Drums used as containers of cod liver oil or other duty free imports are exempt from assessment where it is shown that they are not capable of further use. Barada & Page, Inc., St. Louis, and other importers have been sustained in protesting duty equal to 25% of value of the drums, because they furnished evidence showing that the containers were reduced to junk after delivery. Other claims have been denied by the court, due to the inability of the plaintiffs to prove that the drums did not enter commerce.

Ellis D. Slater *Dr. Louis H. Marks* *Harry E. Dunning*

Three alcohol executives with new responsibilities

New Companies

Registration statements of new companies (under the new Securities Act) made before the Federal Trade Commission in Washington contained but very few companies within the chemical field. Outstanding in the chemical group was: Carbon Dioxide and Chemical, Seattle—A Delaware corporation, producing and manufacturing solid carbon dioxide (dry ice), liquid carbonic gas and filling shells with carbon dioxide, proposes to issue 219,485 shares of common capital stock at $219,485.

On March 17, 1932 over 70 friends of Dr. Marks feted him at a dinner at the Chemists' Club in recognition of his contribution to the Club.

Chemical Fads and Fancies

Air Reduction's president, Charles E. Adams, was 1 of 32 new members recently inducted into the N. Y. State Chamber of Commerce.———Byrd is taking leather lubricants, tested to 50 below zero, to the Pole.———Scientists are still not in agreement about the discovery of the last element—No. 85.———Tung oil tree cultivation was 1st introduced into U. S. in 1905. ———Swedish arsenic producers (by-product of gold mining) 1st tried dumping surplus into the sea, but were forced to stop due to the damage to marine life. Material is now stored in cement warehouses in the hope that new uses will be found. Poisoning is bared—it was the earliest use anyway.———Panthothenic acid is said to be the secret of growth. ———Pierre S. du Pont is 1 of 5 industrial leaders named to serve 4 months on the NRA Industrial Advisory Board. Morris E. Leeds, president of Leeds & Northrup, is also on the Board.———Eysten Berg of the German I.G. is in Canada and it is reported that he is buying large quantities of raw nickel. The I.G. is said to have just perfected a new nickel refining process. ———The old, old story about wiping whole cities out with poison gas has been revived. French chemist, Prof. Leonce Bert, is the latest to make such a "discovery." ———Francis P. Garvan was a member of McKee's finance committee in the recent N. Y. City mayorality campaign.——— Charles J. Brand flew to the Coast and back again to attend a convention and to see his mother who is 93 years old.——— The moose hunters this season are Edgar Queeny, Monsanto's president and Harold Bennett, Melrose Chemical head.——— Oct. 21, 1933 marked 100th anniversary of the birth of Alfred Bernhard Nobel—inventor of dynamite.———Charles Herman Seydel, son of the president of Seydel Chemical, was married last month to Miss Eleanor Kirby Speer, a daughter of former Judge and Mrs. William Henry Speer, of Jersey City.———A. C. S. *I. E. C.* is authority for the report that German chemists are to make rat catching a profession.———Citizens of Madera County, Calif., are all excited over the report that they are residing over a huge helium deposit.———Lammot du Pont, President of the du Pont Co., is engaged to be married to Miss Margaret A. Flett of Wilmington and Racine, Wis. The bride-to-be's brother-in-law, Willis F. Harrington, is a du Pont vice-president. Mr. du Pont, who is 53, is the 8th member of his family to head the du Pont Co., founded in 1802. He succeeded to the presidency in March, 1926, in place of his brother Irenee. On Feb. 7, 1929 Mr. du Pont succeeded his brother Pierre, as chairman of the board of General Motors. ———Harry L. Senderoff, a Brooklyn laundry chemical dealer, testified that he did not offer a $2,500 bribe to a witness in the recent Brooklyn, N. Y., laundry racket trial.———Chemical Salesmen watched others "take it on the chin" Nov. 13. Downtown Athletic Club (N. Y. City) was the place. A good dinner, plenty of "fixins, 3.2 and a number of good bouts made his new innovation most enjoyable.———Carbide's A. Cressy Morrison is the head of a new finance committee named by the Committee on Unemployment & Relief for Chemists and Chemical Engineers (Metropolitan area) to solicit funds for relief work in the coming year. William Buffin (Chemical Foundation secretary), George Hasslacher, and Dean W. T. Reid, Rutgers, are also members of the Committee. Funds are nearly exhausted. Frank Breyer's Committee raised $25,000 for '32. Your help is again sorely needed.———H. V. B. Smith of H. J. Baker & Bro. arrived back Oct. 31 after a month's stay abroad.——— R. J. Merigeault, export sales manager for the Spanish potash producer, Potasas. Ibericas, arrived in N. Y. City Nov. 1. ———Dr. Alcan Hirsch consultant to the Soviet heavy chemical industry, gave a talk at the Chemists' Club (N. Y.) on Nov. 10 on "The Chemical Industry of the Soviet Union: its Planning and Economic Development."———Bismuth nitrate is advocated as a soap preservative by a German chemist.———Percy C. Magnus, president, N. Y. City Board of Trade and a member of the Citizen's Advisory Committee, formed to help in suggesting economies for N. Y. City budget, resigned, assigning as his reason that the suggestions of the committee were not being followed. ———Extensive potassium chloride deposits are reported found near Antofagasta, Chile.———Fernand Pisart, Katanga copper managing director, arrived recently on the *Majestic*. He sees little likelihood of a copper cartel.

Obituaries

William T. Elkinton, 73, chairman of the Board, Philadelphia Quartz, died Oct. 25. He was the 3rd generation of his family in the business which celebrated its centenary in 1931, and 7th generation of the Elkinton family in America.

Through more than 50 years of active business life, which saw his Company expand from a local enterprise to a business of national scope, William T. Elkinton consistently remembered his religious and philanthropic responsibilities. To use an expression taken from an old letter quoted in the Company's centenary booklet, he was concerned always "to dwell under a proper regard for the best things." Naturally modest and retiring, he did many good works known only to those immediately concerned, but he also held numerous offices of trust in religious and welfare enterprises. He was for many years Treasurer of Philadelphia Yearly Meeting of the Society of Friends.

William T. Elkinton

He was known by his patient steadfast character, formed by rigid self discipline and unfailing consideration for the personalities of those with whom he came in contact. He never hesitated to put his sense of right above personal gain, nor to espouse an unpopular cause at the dictates of his sensitive conscience.

He is survived by his wife, Eleanor Rhoads Elkinton and 2 children, Thomas W. Elkinton, president, Philadelphia Quartz, and Anna Elkinton Evans. His sister, Mrs. Inazo Nitobe resides in Tokio, Japan, and his brother Alfred C. Elkinton, Berkeley, Calif., is president, Philadelphia Quartz Co. of California, Ltd.

Frederik Engstrom

Frederik Engstrom, 71, United Carbon chief chemist, died at his home in Charleston, W. Va., Oct. 6. He was born in Sweden and came to U. S. in 1883. After 5 years in the lumber business he joined Peerless Carbon as superintendent. In 1900 he joined hands with another Swede, Oscar Nelson. Since then the lives of these 2 carbon black industry leaders were closely interwoven.

Charles F. Abbott

Charles F. Abbott, 57, executive director, American Institute of Steel Construction, died Oct. 27. From 1919 to 1921 he was director of commercial research and publicity for National Aniline. He was also with Sales Celluloid.

James H. Gibboney

James H. Gibboney, 54, Norfolk & Western Railway chief chemist, died Oct. 30. He had been connected with the chemical department of the railroad since 1906 and had been chief chemist since 1925. He was a graduate of Virginia

Poly and from 1901 to 1903 was assistant chemist at the Virginia Agricultural Station; 1903 to 1904, chief chemist for the Virginia Iron, Coal and Coke Co.; and 1904 to 1906, he was chemistry instructor at Virginia Poly and chemist for the Virginia State Geological Survey. Mr. Gibboney was president of the A.S.T.M., in '26 and '27.

John W. Sherwin

John W. Sherwin, 55, an outstanding executive in the borax field died recently. He was general manager and treasurer of West End Chemical at the time of his death. He started with this company as general manager when it was first organized.

John T. Enequist, 75, president of Seldner & Enequist, Brooklyn, died Oct. 27 at the home of his daughter in Garden City, N. Y., after a long illness.

Frederick Phillips Bagley, 73, president George S. Merrill Co. (Boston division of General Printing Ink) died Oct. 29.

Maurice Barnett, 68, retired chemist and a former secretary of the Casein Co. of America, died Oct. 26.

William Henry Barber, 78, chairman of the board, W. H. Barber Co., Minneapolis distributor of petroleum materials, naval stores, heavy chemicals, etc., died Oct. 12.

Also Died

John Smylie Herkness, 54, president Charles Eneu Johnson & Co., Philadelphia ink-makers, died Oct. 4 . . . Wallace E. McCaw, 62, former Colgate-Palmolive-Peet vice-president, died Oct. 4 . . . Herbert Thompson, 53, Union Carbide general traffic manager, died Sept. 30 . . . John Parker, 75, well-known linseed oil man, died Oct. 12. Other deaths: William Sydnor Penick, 66, chairman of the board and a founder, Penick & Ford, on Oct. 13; Mrs. Betty R. Deupree, mother of R. H. Deupree, Procter & Gamble president, on Oct. 16.

Cyanamid Again Buys

The American Cyanamid Co. announces the acquisition of the Filtration Equipment Corp., which owns the Laughlin Equipment and Process of sewage treatment by chemical-mechanical methods. Officers of the new corporation are:—president, R. C. Jeffcott; vice-president, W. C. Laughlin, J. T. Fetherston, John W. Boyer; treasurer, C. B. E. Rosane; secretary, W. S. Weeks.

New corporation will operate as a separate division of the parent company and actively promote further installation of this equipment and the modern processes of sewage disposal as exemplified in the plant installed and successfully operating at Dearborn, Michigan. Headquarters will continue to be maintained at 350 Madison ave., N. Y. City.

Heavy Chemicals

Benington With Mutual

Following closely on the heels of the announcement that Frederick W. White, after 23 years as president of Mutual Chemical, would become chairman of the

A. A. C.'s former vice-president turns from fertilizers to bichromates

board (a newly created office) and that former vice-president and general manager, Dr. Herbert H. Kaufman, would assume the duties of the presidency, came news of the election of George A. Benington to a vice-presidency. His official title will be vice-president in charge of sales.

Mr. Benington has been with A.A.C. for the past 8 years in various capacities. He was 1st connected with Bowker Chemical (an A.A.C. subsidiary, producing di- and tri-sodium phosphates, insecticides, etc.). At the time of Mr. Benington's resignation he was vice-president and general manager of A.A.C. He was also with W. R. Grace & Co., for 10 years.

'34 Prices Slightly Higher

Price changes were more numerous in October than in September, largely on the upward side. Tonnages were disappointing. Strikes, particularly in the important Paterson-Passaic area, were largely responsible; slowing down of a number of basic industries also contributed to the rather poor showing. The return of most of the striking dyers to work Oct. 24, after 2 idle months helped to give general conditions a better tone as the month closed.

Phosphate prices were suddenly advanced around the middle of the month approximately 35c per cwt. The schedule was then adjusted downward, however, on Oct. 20, the base price being $2.60 for tri-salt in carlots, bbls., and $2.10 for di-material. Market appeared rather firm at these figures. Barium salts were much stronger. Whiterite, 90%, was advanced $5 a ton. Barium chloride prices were also sharply higher. Latest prices quoted are:

Important Price Changes

ADVANCED	Oct. 31	Sept. 30
Acid, chromic	$0.12½	$0.11½
Arsenic, red	.14	.13
metal	.40	.35
Barium carbonate (Whiterite) 90%	45.00	40.00
Barium nitrate, imp.	.08½	.07½
Barium chloride	74.00	65.00
Magnesite, calcined	58.00	53.00
Potassium carbonate		
96-98% cal.	.07¾	.07½
80-85% cal	.07	.06¾
Hydrated	.07	.06¾
Sal soda, bags	1.00	.90
bbls.	1.10	1.00
Sodium phosphate, tri., c.l.	2.60*	2.50
di, c.l.	2.10*	2.00
Strontium nitrate, imp.	.10½	.07½

*l. c.l. prices increased also.

DECLINED		
Copper carbonate	$0.15½	$0.16¼
Tin tetrachloride	.24	.24½

1934 Contract Prices

Long awaited alkali prices were announced Nov. 4.

SODA ASH	Light per 100 lbs.	Fluffy	Dense
Bulk, cl.	$1.05	$1.05	$1.10
Paper bags, cl.	1.20	....	....
Burlap bags, cl.	1.23	1.23	1.25
Bbls., cl.	1.50	1.60	1.50

CAUSTIC	Solid	Ground & Flake	Powd.
	$2.60	$3.00	$3.00

LIQUID	50%	70%
	$2.25	$2.30

Chlorine carlot prices were also advanced. Single unit quotation is now $1.85 and multi-unit, $2.00. No changes were made in the single cylinder quotations.

Anhydrous ammonia schedule was released on Nov. 1. N. Y. Metropolitan area spot price remains unchanged. Starting Nov. 27 and during period ending Dec. 31, 1933, contracts for buyers' 1934 calender year requirements at prices uniformly 1½c per lb. below the schedule will be taken.

Phosphate contracts are being written at the prices announced Oct. 20 and given in detail in the market report.

carlots, bags, $72; bbls., $74; less carlot, bags, 5 net tons or over $83; bbls., $85; less than 5 tons, $85 for bags; $87 for bbls. Prices are f.o.b. consumers' siding for carlots, and for lcl door delivery.

Potassium carbonate was ¼c higher due to exchange rates. Sal soda 1934 contracts were being accepted at an advance of 10c per cwt. Sodium bicarbonate contracts were being renewed without price change. So also were sodium nitrite contracts. Continued activity in the automotive field and higher bichromate costs were responsible for a firmer tone in chromic.

Copper carbonate (high grade) declined when the metal price weakened to 7½c. At the close of the month no upward revision was made, although the metal market firmed considerably, closing at 8½c. Importers of red arsenic and the metal found it necessary to adjust prices because of exchange.

The end of October failed to see much contract activity. In the main consumers are expecting higher prices in most commodities. With the Chemical Alliance Code still unsigned and with several important questions yet to be answered producers are not keen to make commit-

ments. In most quarters feeling seems to be, however, that higher alkali and bichromate prices are inevitable. Some strengthening of sulfuric is also looked for, but it is felt that no change in the schedule will be made. Strong possibility of higher prices for most items, plus possible inflationary measures, it is thought, will lead most consumers to order rather heavily in the last 2 months of this year on existing contracts with the idea of building up a fair-sized year-end inventories.* This policy, of course, is the direct opposite of what took place at this time a year ago. For this reason and also because of the back-log in the textile field (caused by the bitter strikes in New Jersey, New England, Pennsylvania and parts of the South) November tonnages are likely to exceed October.

Company News

Jefferson Lake Oil plans to speed up sulfur production. Lake Peigneur lake bed is estimated to have 1,000 acres of potential sulfur production; only 60 acres have so far been touched. Company produced 150,000 tons in 1st 6 months of '33. New equipment will raise annual capacity to 400,000 tons. Daily rate will have a potential capacity of 1,400 tons.

General American Transportation has received Du Pont's order for 10 special tank cars for transportation of anhydrous ammonia. Each car will have a capacity of 50,000 lbs. Tanks will be forge-welded and surrounded with 4 inches of cork insulation. Cars are now being built in General American's tank car plant at Sharon, Pa.

D. H. Litter Co. has moved to large quarters at 500 5 ave., N. Y. City. Company is a selling agent for Anderson-Prichard Oil, Pacific Coast Vegetable Oil, Falk & Co., Pure Calcium Products, Nuodex Products, and Carbola Chemical.

Corn Products' Argo, Ill., plant has curtailed operations. Processing tax is partly blamed.

Industry Notes

Japanese bichromate made its appearance in United Kingdom markets in September. Total U. K. imports amounted to 2,641 cwts., valued at £3,803. Jap quantity totaled 54 cwts., (£75); balance, Germany, 2,271 cwts., (£1,804); U. S., 800 cwts., (£1,200); Russia 516 cwts., (£724) . . . J. M. Huber Co. of La., Inc., carbon black producing unit of J. M. Huber Corp., has taken over Skellytown carbon black factory of Magnolia Petroleum.

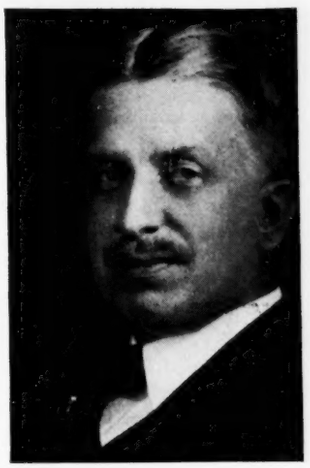
Code for the hardwood distillation industry has been approved by Administrator Johnson.

*'34 contract prices are generally being written with special clause providing for price adjustments July 1 in the event of dollar devaluation, higher costs, etc.

Fine Chemicals

An Industry Loss

Harry Armand Stebbins, 57, Merck's assistant manager in N. Y. City, died suddenly in Chicago while attending the Exposition. In 1890 he started his business



career in the N. Y. office of Powers & Weightman. In 1903 when the company Powers-Weightman-Rosengarten was formed he continued to remain in N. Y. City. For a number of years he was assistant manager under Charles A. Loring and in 1920 succeeded the latter. In 1927 when Merck absorbed P-W-R he became assistant manager at N. Y. He is survived by his wife, Minnie A. Stebbins.

Fewer Price Changes

Price changes were fewer in October than for several months past. This was somewhat strange for the exchange fluctuations were quite violent at times. For the 1st part of the month the dollar weakness was very pronounced and continuous. Manufacturers, however, appeared to be willing to withhold price adjustments on spot goods pending some pronouncement of the Government on its monetary policy. President Roosevelt's address and the embarking of the Government into gold purchases both domestic and abroad caused the dollar to recover quite a little of the ground lost earlier in the month. Silver declined sharply early in the month (see Metals & Alloys Section for weekly price changes) and as a result silver nitrate fluctuated rather widely. However, it not only recovered but actually closed the month with a gain.

Mercury price remained firm in the face of extremely light demand. Strength was partly attributed to the fact that the Mercury Cartel has been renewed. Rumor was about in the trade that ethyl alcohol prices had been withdrawn. This proved to be untrue, however. With repeal of the 18th amendment, however, but a matter of a few weeks, producers were very firm on prices. The anticipated rise in c.p. glycerine did not occur but both the local and Chicago markets were particularly firm. Radiator glycerine, it is reported, will retail for not over $1.45 a gal. this year. The ups and downs in crude iodine reflected simply the changes in the rate of exchange. No announcement has as yet been made on 1934 formaldehyde prices, but it is rumored that some business has been placed at existing levels.

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Alcohol, benzyl	$0.85	$0.75
Acid tartaric, dom.	.25	.24
Cream of Tartar, crystals	.18½	.18
powd	.17½	.17
Iron-ammonium oxalate	.27½	.26½
Iron-sodium oxalate	.27½	.26½
Silver nitrate	.29⅞	.29⅝
Terpin hydrate	.41	.38
DECLINED		
Menthol, cases	$2.60	$2.75

Heyden Suit

U. S. Supreme Court on Oct. 9 refused to review a case brought by Chemische Fabrik on Heyden, involving taxes assessed against property of the company in the hands of the Alien Property Custodian at the close of the World War.

Custodian seized the stock of the firm's American subsidiary, Heyden Chemical, and sold it in 1919, retaining proceeds for the account of the company. The Collector of Internal Revenue held the sale to be a capital gain and collected taxes of $500,000 from the account with the custodian.

Merck and NRA

President George W. Merck announced Nov. 2 that between June 17 of this year and Oct. 17 number of employes of the company had been increased 13%. During same period total payroll showed a similar percentage increase. These figures are contained in the NRA report submitted to President Roosevelt.

Italian synthetic camphor exports amounted to 99 tons during 1st 5 months of this year. These exports were 358 tons in 1931 and 384 tons in 1932. There is only 1 Italian producer, the S. A. Marengo, Genoa, which is controlled by Montecatini.

A mixture of 3% gasoline would, on the basis of an average annual domestic consumption of gasoline of 15,793,260,000 gals. over past 5 years, require 473,798,000 gals. of grain alcohol. Average annual wheat surplus of 200,000,000 bu. would yield 500,000,000 gals. of alcohol.

Coal Tar Chemicals

Firm Price Position

Coaltar chemicals were quiet in the past month. Aside from the announcement of 1934 naphthalene prices (given in detail elsewhere on this page) price revisions were very few. Continued decline in steel operations and coking tended to maintain prices of crudes. On the other hand, demand for dyes and intermediates was seriously curtailed as a result of labor troubles in silk and rayon dyeing and finishing centers. At least temporary settlement, effected late in the month, is expected to speed up demand for dyestuffs. After several months of scarcity the supply of toluol seemed ample for the rather restricted demand caused by the drop in automobile production and the decline in Akron tire operations to about 35-40% of capacity.

Estimated September benzol production of 6,501,000 gals. from coke production at by-product ovens known to recover benzol, is a decline of 9.2% from previous month, with August output placed at 7,157,000 tons. Output of benzol in September, 1932, was 3,394,000 gals. For 1st 9 months total amount of benzol recovered was 45,332,000 gals. as against 36,222,000 gals. in same period last year.

After 4 months of increasing activity, average daily production of coke decreased 4.4% in September, as compared with year's high average of August. In contrast, daily rate for pig iron decreased 14.2% during same period. Production of by-product coke for September was 2,712,050 tons. In comparison with August, this was a decrease of 7.2% in tonnage and 4.1% in daily output. Stocks at by-product plants increased slightly from 2,915,388 tons at the close of August to 2,984,797 tons at the end of September. This increase was principally at merchants plants. Coking coal charged in by-product ovens in September amounted to 3,926,577 tons as against 4,235,034 tons in August and 2,232,900 tons in September, 1932. For 1st 9 months coking coal charged in by-product ovens amounted to 28,003,685 tons as against 22,964,900 tons in corresponding period last year.

September production of light oils amounted to 12,015,325 gals. as against 12,959,204 gals. in August and 6,832,674 gals. in September last year. Output of tar for 1st 9 months reached 89,631,276 gals. as against 70,272,594 gals. in corresponding period of 1932, September production of tar was placed at 36,124,508 gals. as compared with 38,962,312 gals. in August and 21,542,680 gals. in similar month last year. Total for 1st 9 months amounted to 257,634,902 gals. as against 211,277,080 gals. in same period 1932.

Important Price Changes

NEW PRICES FOR NAPHTHALENE ANNOUNCED

	F.O.B. N.Y. Oct. 31	F.O.B. Cho. Sept. 30
Ball or flake, carlots, bbls.	6c per lb.	6½c per lb.
50 lb. cases	6½c " "	6¾c " "
16 oz. pkgs.	7c " "	7½c " "
Dyestuffs or chipped, bbls.	5c " "	5½c " "
Ball or flake, spot lcl., bbls.	7¼c " "	7¾c " "
50 lb. cases	7½c " "	8c " "
16 oz. pkgs.	8¼c " "	8¾c " "
Dyestuffs or chipped, bbls., l.c.l.	6¼c " "	6¾c " "

In September output of ammonia sulfate, or its equivalent, declined to 46,078 tons from 49,698 tons in August, and compared with 26,203 tons in September last year. Production for the 1st 9 months totaled 328,623 tons as against 268,523 tons in corresponding period 1932.

Dyestuff Imports

U. S. September synthetic dyestuffs imports amounted to 315,214 lbs., valued at $401,296. September dye imports volume was the smallest in any month since April. It was 47% less than that of the August imports. Month's imports were 24% less in volume, but 10% greater in value, than those in September, 1932. Imports of dyes during 1st 9 months of this year totaled 3,346,639 lbs., valued at $3,561,437, and were 21% larger in volume and 46% greater in value than those in corresponding period in 1932.

Imports of synthetic aromatic chemicals were slightly larger in volume than those in August and those in September, 1932. Their value, however, was much greater than that of the imports in either of the other 2 months. Nine months' total of imports of aromatics was 37% less in volume and 54% less in value than that of corresponding imports in 1932. Imports of color lakes in September were the largest in any month since April, 1932, because of the receipt of 2,205 lbs. of diamond black from the Netherlands. This year's 9 months' total was 17% less than that for corresponding period in 1932.

Imports of intermediates, medicinals, and other coaltar chemicals amounted to 181,175 lbs., ($46,924). They were smaller in volume and value than those in August, but much larger in both respects than those in September, 1932. Imports of these products in the 1st 9 months exceeded those in corresponding period in 1932 by 55% in volume and 92% in value.

Leading September Imports

(A total of 103 individual products and one group—synthetic resins—were specified in the list of imports)

	Pounds
Diazo salt GS	12,798
Betahydroxynaphthoic acid	11,854
2-Amino-5-naphthol-7-sulphonic acid	10,613
4-Nitro-2-anisidin hydrochloride	9,363
Sulphureted phenetolcarbonic acid amide	8,243
5-Nitro-2-anisidin	7,100

Synthetic Dyes Imports

	1933 Pounds	1933 Value
Jan.	314,878	$311,640
Feb.	365,144	369,829
March	267,890	257,626
April	232,741	229,078
May	360,490	352,111
June	382,452	389,174
July	513,436	567,790
Aug.	594,394	682,893
Sept.	315,214	401,296
Totals	3,346,639	$3,561,437

	1932 Pounds	1932 Value
Jan.	297,266	$259,558
Feb.	429,298	367,154
March	482,545	410,865
April	300,144	259,425
May	206,225	203,483
June	117,792	109,208
July	151,089	138,136
Aug.	369,327	329,810
Sept.	414,161	365,326
Totals	2,767,847	$2,442,965

Countries of Origin

	Percentages—September 1933	1932
Germany	56.92	64.07
Switzerland	40.35	34.28
England	2.73	1.62
All other	....	.03

Leading Dyes

(A total of 420 dyestuffs was imported)

	Pounds
Vat golden yellow GK double paste (single strength)	31,100
Cibacete diazo black J powder	7,055
Neutral brown RX	6,615
Celliton fast black B	5,850
Setacyl direct orange 2R powder	4,410
Eriochrome flavin A concentrated	4,409
Brilliant indigo 4G paste	4,250
Immedial direct blue RL extra	4,000

Federation of British Industries has issued "Fuel Economy Review" (2s. 6d.) a report of developments in all branches of fuel technology. Organic chemicals from gas are reviewed.

Company News

H. Kohnstamm & Co. (Edward Kohnstamm); George Leuders & Co. (Ferd. Weber) are new companies joining Drug, Chemical & Allied Trades Section, N. Y. Board of Trade . . . British Cyanides, Ltd., has acquired Pollopas patents controlling manufacture of resins and molding powders of the urea-formaldehyde type for British Empire (except Canada) and certain Continental countries. Full exchange of patent information will be entered into with other licensees including I. G. and Kuhlmann . . . Carbide & Carbon Chemicals has been awarded *Chem. & Met's* 1st chemical engineering achievement award . . . Cyanamid has opened a Detroit office in charge of George S. Horsfull . . . Clarence A. Southerland (a Wilmington attorney) is temporary receiver for Consolidated Chemical . . . Bay State Chemical (tanners' finishers & dry colors) has opened Milwaukee branch at 710 W. Virginia st., in charge of Harry Houlden . . . Russell B. Stoddard, Baltimore, now represents S. Schwabacher & Co., N. Y. City mineral oil importer in that territory . . . G. E. will have a "House of Magic" exhibit at the Chemical Show . . . Naugatuck Chemical has appointed Walter H. Jelly & Co., Chicago, as Mid-west representative.

Fertilizers

Presidential Approval

Fertilizer industry's code was approved and signed by President Roosevelt Oct. 31. Code was formally submitted to General Johnson on Aug. 19, through General C. C. Williams, Assistant Administrator in charge of the chemical industries in the Recovery Administration. Public hearing was held on Sept. 6.

"The 1st effect of operation under the Code will be to advance wages in the fertilizer industry about 60% above present levels," declared Charles J. Brand, N. F. A. executive secretary. "Average wage for common labor in all fertilizer plants is now 16.8c an hour. Code increases average wage to 27c an hour. Most firms in the industry are already paying the wage scales required by the Code under the terms of the President's reemployment agreement. Average worker has been working about 55 hours per week, and under the Code he will work only 40 hours, except in the rush season. Net effect of the increase in wages and the shortening of hours will mean that the labor cost of making fertilizer will be practically doubled. It is estimated that, operating under the Code, the industry will reemploy immediately approximately 4,000 workers," said Mr. Brand.

"In all but 2 or 3 years since the World War the fertilizer industry as a whole has lost money, chiefly through the sale of goods below cost and the inability of many farmers to pay for their fertilizer. One of the objectives of the recovery program is to restore reasonable profit to industry by preventing ruinous competition. It is obvious that if the industry is to serve the farmer properly and to pay the higher wage rates provided by the Code and if it is to be permitted to make a small profit instead of losing money year after year, there must be some increase in the price of fertilizer to the farmer. I feel sure, however, that this increase in price will not be out of line with the increase in farm purchasing power during the past few months.

"In March of this year when farmers were buying their fertilizer the prices of farm products at the farm were only 50% of pre-war. Fertilizer prices at the factory were 71% of pre-war, and fertilizer sales were far below normal. Farm prices are now 70% and fertilizer prices at the factory 77% of pre-war. These figures show that the relative cost of fertilizer, in terms of farm products prices, has declined substantially since last March."

Final approval of the Code was held in abeyance for several weeks due to the fact that several nitrogen and potash producers objected to being included within the fertilizer code. These differences, after several conferences, were finally compromised in a manner satisfactory to both sides. Following revisions were finally incorporated into the code before it was signed by General Johnson: the definition of the fertilizer industry was extended and includes nitrogen and

September Fertilizer Tag Sales

	Equivalent tons*							
	September				January-September			
	P. C. of 1932	1933	1932	1931	P. C. of 1932	1933	1932	1931
South—								
Virginia†	85	34,934	40,992	30,513	106	272,297	255,897	349,354
North Carolina	97	9,271	9,536	10,855	128	837,071	654,722	984,105
South Carolina†	153	5,075	3,311	2,586	125	536,256	429,705	582,691
Georgia	534	1,067	200	233	110	390,365	355,854	684,855
Florida†	103	23,700	22,910	20,059	89	220,982	246,906	285,477
Alabama	33	100	300	100	134	271,650	202,450	417,500
Mississippi	...	620	...	250	103	86,016	83,616	195,586
Tennessee†	78	3,825	4,925	3,775	117	68,489	58,458	113,074
Arkansas‡	...	5			125	21,590	17,298	61,046
Louisiana†	129	5,150	4,001	5,706	119	43,344	36,576	80,039
Texas†	108	2,630	2,425	4,115	94	30,190	32,148	62,057
Oklahoma	100	50	50	100	68	1,985	2,925	6,839
Totals, South	97	86,427	88,650	78,292	117	2,780,235	2,376,555	3,822,623
Midwest—								
Indiana	133	32,828	24,719	22,731	120	93,631	77,978	163,049
Illinois	20	278	1,397	2,220	78	8,856	11,406	29,510
Kentucky	264	4,885	1,850	3,998	102	54,697	53,556	103,472
Missouri	169	14,714	8,726	12,899	119	28,510	23,921	45,048
Kansas	55	425	775	1,077	67	§1,493	2,220	2,781
Totals, Midwest	142	53,130	37,467	42,925	111	187,187	169,081	343,860
Grand totals	111	139,557	126,117	121,217	117	2,967,422	2,545,636	4,166,423

*Monthly records of fertilizer tags are kept by State control officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States. †Cottonseed meal sold as fertilizer included. ‡Excludes 34,400 tons of cottonseed meal for January-September combined, but no separation is available for the amount of meal used as fertilizer from that used as feed. §Revised.

United States Imports and Exports of Fertilizer and Fertilizer Materials By Classes—Total for All Countries—Long Tons

IMPORTS

	September			August-September		
	1933	1932	1931	1933	1932	1931
Ammonium sulfate	27,899	33,995	13,819	41,046	52,571	20,590
Ammonium-sulfate-nitrate	0	0	496	0	0	497
Calcium cyanamide	1,593	3,822	2,794	3,607	8,389	5,379
Calcium nitrate	22	0	4	985	0	4
Guano	12,765	4,550	65	18,011	4,570	153
Dried blood	937	90	605	2,832	335	1,470
Sodium nitrata	5,248	517	48,604	9,191	517	83,971
Urea and calure	308	316	638	709	379	717
Ammonium phosphates	191	*	*	489	*	*
Tankage	2,178	1,032	1,624	5,094	2,576	2,821
Other nitrogenous	5,541	495	1,387	8,847	1,719	2,369
Total nitrogenous materials	56,682	44,817	70,036	90,811	71,056	117,971
Bone phosphate	2,138	1,824	2,758	4,725	3,158	5,265
Superphosphates	1,880	1,059	*	3,796	3,773	*
Phosphate rock	5,625	0	*	5,625	0	*
All other phosphates	0	350	3,417	100	365	10,768
Total phosphate materials	9,643	3,233	6,175	14,246	7,296	16,033
Muriate of potash	11,607	8,284	25,563	24,759	17,764	51,249
Kainite, 1%4	1,582	5,299	1,831	7,256	7,906	5,838
Kainite, 20%	6,217	‡	‡	12,086	‡	‡
Manure salts, 30%	11,408	14,902	27,608	29,622	24,094	56,211
Sulfate of potash	5,707	5,045	11,430	11,649	7,388	18,171
Sulfate of pot. magnesia	1,494	*	*	6,071	*	*
Nitrate of potash	964	*	*	3,499	*	*
Other potash	27	4	8	109	32	14
Total potash materials	39,006	33,534	66,440	95,051	57,184	131,483
Nit-phos-& pot. fertilizers	180	622	0	421	864	3
Other fertilizers	1,565	5,296	4,063	8,575	8,663	8,824
Grand total	107,076	87,502	146,714	209,104	145,063	274,314

EXPORTS

Ammonium sulfate	2,330	3	118	3,119	352	567
Other nitrogenous chemicals†	15,913	32,314	7,185	23,169	46,697	13,743
Nitrogenous organic waste	1,591	274	251	2,174	776	926
Total nitrogenous materials	19,834	32,591	7,554	28,462	47,825	15,236
High grade hard rock	3,000	4,789	8,590	10,211	9,938	45,855
Land pebble rock	83,962	24,560	98,424	153,318	55,612	162,731
Total phosphate rock	86,962	29,349	107,014	163,529	65,550	208,586
Superphosphates	9,921	635	8,455	12,712	1,130	12,412
Other phosphate materials	598	21	152	668	33	518
Total phosphate materials	97,481	30,005	115,621	176,909	66,713	221,516
Potash fertilizers	4,175	90	50	4,319	93	51
Concentrated Chem. fertilizers	1,424	1,626	3,813	3,305	2,435	5,237
Prepared fertilizer mixtures	375	374	915	727	546	1,298
Grand total	123,289	64,686	127,953	213,722	117,612	243,338

*Not previously stated separately. ‡Included in kainite, 14%. †Chiefly domestic synthetic sodium nitrate.

potash producers, insofar as their sales to dealers and consumers are concerned, until such time as they have adopted and are operating under codes of their own.

Definition of producer was changed by adding the words, "or importing," thus bringing importers of fertilizer materials under the code. New provision was made for the collection of statistics in the industry. Appointment of an industry administrative committee was authorized.

Definition of unfair trade practices was extended to include furnishing of fertilizer in return for produce to be grown with the use of such fertilizer. State of Tennessee was included in zone 8, and Hawaii was made zone 11C.

Potash Discounts Reduced

Signing of the fertilizer industry code (Oct. 31) came too late to stimulate any buying interest. The entire industry was more concerned with the outcome of the controversy between sellers of nitrogen and potash materials and the industry generally. As in most cases of honest differences of opinion a compromise was finally effected. It is hoped that the industry will now be able to turn its attention more seriously to forward purchasing.

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Blood, Chgo	$2.25	$2.00
Calcium nitrate	25.50	25.00
Castor pomace	20.50	20.00
Hoof meal	1.45	1.40
Potash salts*.		
Tankage, imp.	2.65	2.60
Urea	90.00	82.60
DECLINED		
Bone meal, 3 and 50	$25.00	$25.75
Linseed cake	24.00	25.00
Linseed, meal	33.50	35.00
Nitrogenous material, dom.		
West	1.75	2.00
East	2.35	2.75
Imported	2.50	2.60

*Discounts reduced 5½%.

Outstanding price change of the month was naturally the reduction of 5½% in the temporary potash discounts (offerings only made to Nov. 30). In most quarters this action merely strengthened the belief that when the '34 figures are finally released they will show substantial increases over '33. In nitrogen increases were made in imported calcium nitrate and fertilizer urea. Changes in organic ammoniates were relatively unimportant. Bone meal, imported 3 & 50, declined sharply near the close of the month. No indications are yet discernible as to sulfate or nitrate prices after the 1st of the year, but generally the industry is said to be looking for higher quotations. Granular cyanamid is now being quoted at $34 a ton at producing point with freight allowed. The Baltimore superphosphate market appeared to be much firmer.

Talk is heard in the industry of the possibility of Government restriction of fertilizer sales in connection with acreage curtailment, but little credence is given to any such possibility.

Fertilizer Application Meeting

Joint Committee on Fertilizer Application will hold its annual meeting in Chicago, Nov. 15. A sub-committee representing N. F. A. assembled in Washington Nov. 6 to formulate suggestions to be presented at the Chicago meeting. Membership of this sub-committiee is as follows: Dr. Firman E. Bear, Chairman; George J. Callister, Sidney B. Haskell, Myron S. Hazen, David D. Long, H. B. Siems and H. R. Smalley.

Production and Purchase of Sulfuric Acid

Tons

	August, 1933	**July, 1933*	*August, 1932*	*January-August 1933*	*January-August 1932*	*January-August 1931*
Produced by reporting establishments—						
Totals	131,492	98,587	58,345	764,886	571,924	1,010,104
†Northern district	82,472	79,919	47,104	523,510	420,176	697,935
Southern district	49,020	18,668	11,241	241,376	151,748	312,169
Purchased from fertilizer manufacturers—						
Totals	29,102	23,829	12,404	117,415	61,288	‡
Northern district	11,165	12,407	4,830	55,033	29,362	‡
Southern district	17,937	11,422	7,574	62,382	31,926	‡
Purchased from non-fertilizer manufacturers—						
Totals	21,804	16,147	6,586	109,125	96,869	209,321
Northern district	9,606	8,159	3,922	64,929	55,578	121,713
Southern district	12,198	7,988	2,664	44,196	41,291	87,608
Consumed in Fertilizer Manufacture and Shipments						
Consumed by reporting establishments in production of fertilizer—						
Totals	116,322	71,951	52,272	646,759	440,019	998,981
Northern district	51,698	45,001	32,330	346,248	262,315	589,792
Southern district	64,624	26,950	19,942	300,511	177,704	409,189
Shipments—						
To other than fertilizer manufacturers—						
Totals	41,970	38,885	24,380	240,528	175,864	274,993
Northern district	37,377	37,374	21,605	221,420	152,430	222,301
Southern district	4,593	1,511	2,775	19,108	23,434	52,692
To fertilizer manufacturers—						
Totals	16,511	13,251	5,720	114,400	114,771	‡
Northern district	11,775	10,082	5,160	87,792	88,388	‡
Southern district	4,736	3,169	560	26,608	26,383	‡
Stocks on Hand						
Totals	92,998	86,403	94,465	.....	.....	.....
Northern district	67,114	64,721	72,652	.....	.....	.....
Southern district	25,884	21,682	21,813	.....	.....	.....

*Revised. †Northern district, States north of Virginia-North Carolina line; Southern district, States south of Virginia-North Carolina line. ‡Data not available.

August Superphosphate Production

PRODUCTION AND RECEIPTS

Short tons

	August 1933	*July 1933*	*August 1932*	*January-August 1933*	*January-August 1932*	*January-August 1931*
Production—						
Bulk superphosphates—						
Totals, United States	262,705	164,666	112,919	1,477,080	1,063,722	1,973,530
Northern district	131,483	108,991	74,583	851,646	697,420	1,202,120
Southern district	131,222	†55,675	38,336	625,434	366,302	771,410
Base and mixed goods—						
Totals, United States	7,249	9,481	7,583	62,914	55,187	‡
Northern district	4,505	8,443	5,706	35,623	25,031	‡
Southern district	2,744	1,038	1,877	27,291	30,156	‡
Received from other acidulators (including inter-company transfers)*—						
Totals, United States	20,461	14,127	7,350	171,334	120,654	‡
Northern district	13,829	12,303	6,870	106,142	89,496	‡
Southern district	6,632	1,824	480	65,192	31,158	‡
SHIPMENTS						
Bulk superphosphates—						
Totals, United States	72,455	65,358	63,433	1,277,141	1,165,826	‡
Northern district	56,033	53,628	49,657	691,383	638,167	‡
Southern district	16,422	11,730	13,776	585,758	527,659	‡
To mixers—						
Totals, United States	43,854	35,498	38,839	534,066	507,201	‡
Northern district	36,992	29,571	29,200	362,147	314,435	‡
Southern district	6,862	5,927	9,639	171,919	192,766	‡
To other acidulators (including inter-company transfers)—						
Totals, United States	13,198	12,345	12,319	125,796	98,773	‡
Northern district	7,649	9,073	11,281	82,455	68,850	‡
Southern district	5,549	3,272	1,038	43,341	29,923	‡
To consumers—						
Totals, United States	15,403	17,515	12,275	617,279	559,852	858,330
Northern district	11,392	14,984	9,176	246,781	254,882	417,758
Southern district	4,011	2,531	3,099	370,498	304,970	440,572
Base and mixed goods—						
Totals, United States	23,302	15,714	13,438	894,855	701,350	‡
Northern district	11,976	9,908	9,515	362,188	366,586	‡
Southern district	11,326	5,806	3,923	532,667	334,764	‡
STOCKS						
Bulk superphosphates—						
Totals, United States	691,913	565,370	868,657	.....	.....	.....
Northern district	352,866	317,305	427,020	.....	.....	.....
Southern district	339,047	*248,065	441,637	.....	.....	.....
Base and mixed goods—						
Totals, United States	264,165	198,131	323,894	.....	.....	.....
Northern district	186,516	142,288	172,412	.....	.....	.....
Southern district	77,649	55,843	151,482	.....	.....	.....

*Includes both bulk superphosphates and base and mixed goods. †Revised. ‡Data not available.

Gums, Waxes, Shellac

Important Price Changes

Gums

ADVANCED

	Oct. 31	Sept. 30
Arabic sorts	$0.07¾	$0.07½
Gamboge, pipe	.60	.55
Powd.	.65	.60
Ghatti	.09	.08½
Mastic	.37¼	.30
Sandarac	.48	.40

DECLINED

Camphor, slabs	.48½	.49
Dammar Batavia A/E	.12½	.13

Waxes

ADVANCED

Beeswax, African	$0.18½	$0.18
Chilean	.22	.21
Brazilian	.22	.21
San Domingo	.21	.20
Carnauba, No. 2 N. C.	.16½	.16
No. 3 N. C.	.13¾	.13
No. 3 Chalky	.13¾	.13
Japan	.07	.06¾

Weakness—Then Strength

Immediate effect on the gum and wax markets of President Roosevelt's gold purchase plan (contained in his radio address Oct. 22) was to strengthen the general price structure and to raise quotations on sandarac, mastic, camphor and several grades of Carnauba, Japan. Feeling that replacement costs in practically all items are likely to be much higher within the next 60 days importers and jobbers have very firm views on quotations for spot deliveries. Forward purchasing for any appreciable time ahead appears to be at a standstill until the situation clears somewhat and further amplification of the Government's monetary policy is forthcoming.

Spot stocks of sandarac and mastic are reported to be quite small and dealers are particularly bullish on these items. Generally speaking demand was rather quiet in October. Call for the varnish gums was slower than in the previous month.

Exchange fluctuation was responsible for higher quotations on various grades of beeswax and Carnauba. Reports received late in the month indicate that Brazilian Carnauba crop is late. Rather heavy forward purchasing for December-January shipments has given the market a very strong appearance. It is reported in many quarters that it is extremely difficult to get shipments forwarded. An advance of 20c per 100 lbs. in the primary Japan markets was reflected in ½c increase in spot quotations locally.

The shellac markets were in the doldrums during most of the month and prices fluctuated within very narrow limits. In primary centers price changes reflected the rather violent fluctuations of the dollar.

Total Calcutta imports during January-August this year were 39,655 packages of orange, 600 packages of garnet, and 352 packages of buttonlac. This compares with imports last year during corresponding period of time as follows:—Orange, 33,259 packages; garnet, 2,796 packages; buttonlac, 214 packages.

Louis Rupprecht, 60, sales division, James W. Byrnes Sales Corp., died Oct. 29.

Naval Stores

Rosin Prices Go Lower

Naval stores in common with most commodity markets declined quite steadily for the 1st 3 weeks of the month. Following the President's radio address, which was interpreted as a declaration that the Government would force higher commodity prices by 1 method or another, the primary markets took on a much firmer tone and prices advanced. The net changes for rosin for the month are confusing, however, as the accompanying statistics indicate. The net price movement for the month for turpentine was very small. Rumors were about in the primary centers that turpentine would be pegged at 40c.

Receipts for October were about 30% greater than in the same month a year ago. For the season a conservative estimate reports receipts ahead by about 25%. This large increase has offset any possible benefits that might have taken place as a result of the Roosevelt policies. Statistical position of port stocks is as a result in a less favorable position. Tentative approval to the A. A. A. agreement (subject to a final hearing) has supplied cause for a somewhat better feeling on the part of factors and producers, but as yet a great deal of the plan and the various policies to be followed remain undecided. Agreement calls for drastic steps to curtail production and it is evident that some divergence of opinion exists within the industry as to the wisdom and practicability of this policy.

Quite a little talk in primary centers has to do with the possibility of Russia

September production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand Sept. 30, according to data collected by producers' committee, through Arthur Langmeier, Hercules Powder secretary, were:

Production

	Rosin 500-lb. barrels	Turpentine bbls.(50 gallons)	Pine oil Gallons
Month of September	43,213	6,642	258,081
Total from Apr. 1, 1933	221,818	34,894	1,437,974

Stocks at Plants

Totals Sept. 30, 1933	60,305	8,004	.....
Totals, March 31, 1933	98,615	12,387	.....
Change	—38,310	—4,383	.....

Note—Rosin production and stocks include all grades of wood rosin.

Rosin-Turpentine Export Figures April-August

	Season—Rosin†			Season—Turpentine		
Country	*1933*	*1932*	*1931*	*1933*	*1932*	*1931*
United Kingdom	128,237	107,219	104,615	69,018	55,056	45,508
Germany	110,056	105,218	103,866	21,120	10,636	13,811
Italy	24,018	13,478	16,885	625	349	11
Netherlands	43,643	36,526	29,078	26,889	20,202	20,387
Belgium	12,557	12,571	7,876	6,509	6,156	9,297
Norway	5,475	4,946	2,400	.....	.....	.....
Sweden	17,008	12,635	12,894	.....	.....	.....
South America	81,139	73,013	75,719	3,883	3,181	6,569
Japan	28,391	26,434	59,541	533	299	487
Dutch East Indies	26,259	20,639	26,323	.....	.....	.....
Australia & New Zealand	7,563	5,335	6,163	5,312	5,466	6,023
Canada	25,964	19,359	22,656	12,284	10,155	11,553
Cuba	9,103	8,370	8,928	654	181	187
Europe	351,220	294,890	283,486	124,015	93,906	89,422
Total outside of Europe	197,808	169,651	215,176	24,615	20,947	27,531
Total	549,028	464,541	498,662	148,630	114,853	116,961

†In bbls. of 500 lbs., gum and wood rosin; April through August for both rosin and turpentine. To obtain August exports subtract above figures from those appearing in CHEMICAL INDUSRTIES, October, p. 351.

Shellac Prices Weekly High—Low For London, Calcutta, N. Y.

	March High-Low	*London Dec.† High-Low*	*U. S. Cents Dec.*	*March*	*Calcutta T.N.C. & F. N. Y.‡*	*10 bbls.*	*Bone Dry 5-9 bbls.*	*1-4 bbls.*	*N. Y. City T. N.*	*Super-fine*	*Garnet*	*Shellac Varnish Orange* 5 lb. cut	4½ lb. cut	4 lb. cut	*White* 5 lb. cut	4½ lb. cut	4 lb. cut
Week Ending																	
Close Sept. 30					.10¼	.24	.25	.26	.13–.13¾	.14–.14¾	.17–.18	1.00	.95	.90	1.25	1.20	1.15
Oct. 6	60s—59s	61s 6d—57s	13.3	12.8	.11½	.24	.25	.26	.13–.13¾	.14–.14¾	.17–.18	1.00	.95	.90	1.25	1.20	1.15
Oct. 3	60s—59s	62s—61s 6d	13.4	12.8	.11⅜	.24	.25	.26	.13–.13¾	.14–.14¾	.17–.18	1.00	.95	.90	1.25	1.20	1.15
Oct. 20	59s—56s 6d	62s—58s 6d	12.6	12.2	.10⅞	.24	.25	.26	.13–.13¾	.14–.14¾	.17–.18	1.00	.95	.90	1.25	1.20	1.15
Oct. 27	56s 6d—56s	59s 6d—59s	12.8	12.0	.10⅞	.24	.25	.26	.13–.13¾	.14–.14¾	.17–.18	1.00	.95	.90	1.25	1.20	1.15
Close Oct. 31	56s	59s			.10¾	.24	.25	.26	.13–.13¾	.14–.14¾	.17–.18	1.00	.95	.90	1.25	1.20	1.15

*per gal.; †per cwt.; ‡subject to exchange correction (London). Sterling exchange at $4.88. ‡Closing price each week.

becoming a naval stores customer. Prior to the Russian Revolution that country took about 50,000 bbls. a year. In the Soviet regime purchasing has stopped completely except for 3 years, 1926-28.

New Factors' Organization

Naval stores factors have organized the Association of Gum Naval Stores Factors with O. T. McIntosh as president. Other officers: H. Weibert, Jacksonville, vice-president; George W. Drummond, secretary; and A. L. Brogden, treasurer. Executive committee: H. L. Kayton, D. A. Sapp, Millard Reese, H. M. Wilson, E. M. Sessons and H. A. Lurton. H. M. Wilson acted as temporary chairman. Those present included: H. M. Wilson of Turpentine and Rosin Factors, Jacksonville; A. L. Brogden, J. H. Pace and P. J. Rooney of the same company; D. T. Furse, Southern States Naval Stores, Savannah; E. M. Sessons, Consolidated Naval Stores, Jacksonville; H. A. Lurton, The Lurton Co., Pensacola; C. N. Jordan, Operators Factorage Co.; D. A. Sapp, the D. A. Sapp Co., Savannah; H. E. Wickersham, West Florida Naval Stores, Pensacola; Herbert L. Kayton, Carson Naval Stores, Savannah; J. A. G. Carson and C. H. Carson of the same company; H. Weibert, Peninsular Naval Stores, Jacksonville; Millard Reese and George T. Rivers of the Downing Co., Brunswick; Frank Waters of the Lurton Co.; A. G. Cassells and R. F. Cassels, the Cassels Co., Savannah.

A. A. A. Agreement

Proposed Agreement to be entered into between the Federal Government and naval stores producers has been tentatively approved by the legal division of the A. A. A. Copies of the proposed agreement will be sent to all interested and a formal hearing is planned in the near future to be held in Jacksonville.

Hercules powder is considering removal of its Homersville, Ga., camp to a point near Nashville, Ga.

George H. Senn, Philadelphia, is now agent for Mobile Rosin (Taylor Lowenstein subsidiary). He also represents Dixie Pine Products, Hattiesburg, Miss., maker of steam distilled turpentine, pine oil and FF wood rosin.

Naval stores industry proceeded to organize in the past month. Naval stores distributers have formed the Association of Gum Naval Stores Distributors with J. C. Nash, president, Columbia Naval Stores, Savannah, as Association head. Other officers include A. C. Lucas, vice-president, Thomas J. Taylor, Mobile, as vice-president; secretary, Porter Mackall, Savannah; and treasurer, R. E. Thorpe, Savannah.

J. C. Nash is an outstanding leader of the naval stores industry. He has been active in Pine Institute (vice-president in '26); has been a director of the National Paint, Oil & Varnish Association, and was chairman of the 1st 2 naval stores conferences at Savannah in '24 and '25.

Statistics of the Jacksonville Market

Grade	Close Sept. 30	Oct. 7	Oct. 14	Oct. 21	Oct. 28	Oct. 31	Same time as Last Year (Oct.28,1932)	Net Gain or Loss Past Month	Net Gain or Loss from a Year ago Year (Oct. 28)
B	3.77½	3.80	3.70–3.75	3.65	3.65	3.60	2.25	—.17½	+1.40
D	3.77½	3.80	3.70–3.75	3.65	3.75	3.60	2.40	—.17½	+1.35
E	3.77½	3.80	3.70–3.75	3.70	3.75	3.75	2.50	—.02½	+1.25
F	3.77½	3.80	3.75	3.79	3.75	3.80	2.55–2.60	+.02½	+1.20
G	3.77½	3.80	3.75	3.70	3.75	3.80	2.62½	+.02½	+1.12½
H	3.77½	3.80	3.75	3.70	3.75	3.80	2.62½	+.02½	+1.12½
I	3.77½	3.82½	3.75	3.72½	3.75	3.80	2.65	+.02½	+1.10
K	3.77½	3.82½	3.77½	3.72½	3.85	3.82½	3.20	+.05	+.60
M	3.77½	3.85	3.77½	3.72½	3.85	3.82½	3.75–3.80	+.05	+.10
N	3.80	3.85	3.77½–3.80	3.80	3.90	3.85	3.95	+.05	—.05
W.G	4.00	4.00	4.00	4.00	4.00	3.95	4.50	—.05	—.50
W.W	4.25	4.25	4.30	4.30	4.35	4.30	5.25	+.05	—.90
X	4.25	4.25	4.30	4.30	4.35	4.35	5.25	+.10	—.90
Market	Firm	Firm	Firm	Firm	Firm		Firm		

SPIRITS OF TURPENTINE

Price	41¼c	41½c	40½c	40c	40½c	40½c	40	—¾	+½
Market	Firm	Firm	Firm	Firm	Firm				

Week Ending	Spirits Receipts	Spirits Sales	Resin Receipts	Resin Sales	Same as Last Year Spirits Receipts	Same as Last Year Spirits Shipts.	Same as Last Year Resin Receipts	Same as Last Year Resin Shipts.
Oct. 7	2,546	4,417	8,992	6,063	1,951	3,085	8,697	12,282
Oct. 14	2,236	501	8,330	15,750	1,993	1,784	7,166	1,130
Oct. 21	2,192	421	7,949	4,108	2,015	1,679	7,278	7,059
It. 28	2,295	4,461	7,995	11,329	2,349	4,326	10,171	24,636
This month (Oct. 28)	9,274	9,597	33,258	37,453	8,733	10,914	34,633	45,937
Last month	10,547	7,952	37,322	37,885	10,120	40	36,343	830
Since April 1	81,713	81,370	296,559	321,141	72,024	71,522	260,939	256,030
Foreign	.....	67,716	.....	219,080	.....	55,280	.....	173,136
Domestic	.....	13,654	.....	102,061	.....	16,242	.....	82,894

Stocks	Spirits	Rosin	Same as Last Year Spirits	Same as Last Year Rosin
April 1	36,712	116,429	41,691	155,883
Oct. 28*	37,055	91,847	41,750	159,346
Oct. 1	37,378	96,042	43,931	170,653
Net Gain or Loss for month	—323	—4,195	.....	.....

*Stocks Oct. 31, turpentine 33,813; rosin 92,265.

Statistics of the Savannah Market

ROSIN*

Grade	Close Sept. 30	Oct. 7	Oct. 14	Oct. 21	Oct. 28	Close Oct. 31	Same Time as Last Year (Oct. 28, 1932)	Net Gain or Loss Past Month	Net Loss or Gain from a Year Ago (Oct. 28)
B	3.77½	3.80	3.65	3.70	3.50	3.60	2.30	—.17½	+1.20
D	3.77½	3.80	3.67½	3.70	3.65	3.60	2.45	—.17½	+1.20
E	3.77½	3.80	3.72½	3.70	3.80	3.75	2.50	—.02½	+1.30
F	3.77½	3.80	3.77½	3.70	3.85	3.80	2.60	+.02½	+1.25
G	3.77½	3.80	3.77½	3.70	3.85	3.80	2.62½	+.02½	+1.22½
H	3.77½	3.82½	3.77½	3.70	3.85	3.80	2.62½	+.02½	+1.22½
I	3.77½	3.82½	3.77½	3.72½	3.85	3.80	2.67½	+.02½	+1.17½
K	3.77½	3.85	3.80	3.72½	3.85	3.82½	3.25	+.05	+.60
M	3.77½	3.85	3.80	3.72½	3.85	3.82½	3.85	+.05	—....
N	3.80	3.85	3.80	3.80	3.90	3.85	4.00	+.05	—.10
W.G	4.00	4.00	4.00	4.00	4.00	3.95	4.45	—.05	—.45
W.W	4.25	4.30	4.30	4.30	4.35	4.30	5.25	+.05	—.90
X	4.25	4.30	4.30	4.30	4.35	4.35	5.25	+.10	—.90
Market	Firm	Firm	Firm	Firm	Firm	Firm			

*Effective Sept. 19 FF wood rosin quoted at $4.00 per 280 lbs. gross or 235 lbs. net, f.o.b. Southern producing points, carlots. Previous price (made Aug. 26) was $3.90.

SPIRITS OF TURPENTINE†

Price	41¼c	41½c	40¼c	40c	41c	41¼c	40½c	....	+½c
Market	Firm	Firm	Firm	Firm	Firm	Firm			

†All time turpentine high $2.33 Apr. 1, 1920; all time low 22c, Sept. 4, 1896; 1932-33 high 45c; low, 34½; 1933-34 high 50c July 8; low 37½ April 1.

Week Ending	Spirits Receipts	Spirits Sales	Rosin Receipts	Rosin Sales	Same as Last Year Spirits Receipts	Same as Last Year Spirits Shipments	Same as Last Year Rosin Receipts	Same as Last Year Rosin Shipments
Oct. 7	2,833	262	11,238	3,525	2,024		8,150	
Oct. 14	2,780	292	10,373	3,767	1,642		6,369	
Oct. 21	2,118	260	7,367	3.071	1,684		6,330	
Oct. 28	2,137	313	8,676	2,966	1,670		6,264	
Total 4 weeks	9,868	1,127	37.654	13,329	7,020		27,113	
Total 4 weeks ended Sept. 30	11,273	1,587	39,458	17,642	9,031		34,017	
Since April 1-Oct. 26	95,277	.....	331,284	.....	74,527		277,417	

Stocks	Spirits	Rosin	Same as Last Year Spirits	Same as Last Year Rosin
Close Oct. 26*	19,804	113,306	15,100	164,385
Close Sept. 28	17,990	107,704	12,907	109,107
Net Increase or Decrease in Month	+1,814	+3,602	.....	.....

*Stocks Oct. 31, turpentine 19,266; rosin 103,325.

Statistics of the Pensacola Market

Week Ending	Turpentine Receipts	Turpentine Shipments	Turpentine Stocks	Rosin Receipts	Rosin Shipments	Rosin Stocks
Sept. 30	1,069	482	24,381	3,399	4,052	16,227
Oct. 7	759	164	24,976	2,417	916	17,728
Oct. 14	831	486	25,321	2,734	3,459	17,003
Oct. 21	623	247	25,697	2,195	873	18,325
Oct. 28	751	416	26,032	2,838	4,705	16,458

London Naval Stores Market

Week Ending	Rosin Weekly High—Low* W. W. Grade	Turpentine Weekly High—Low*	American Stocks Spirits 1933	American Stocks Spirits 1932
Oct. 6	17s—16s 6d	47s 9d—47s 3d	†15,685	22,429
Oct. 13	16s 6d	48s 10½d—47s 9d	13,601	22,607
Oct. 20	16s	48s—46s 3d	12,678	21,636
Oct. 27	16s	47s—44s	15,451	23,621
Oct. 31 Close	16s	44s		

*Per cwt.; †Stocks Sept. 30, 14,729 bbls.

Oils and Fats

The Trend is Down

The oils markets closely followed the trend of the stock and other speculative commodity markets. For the 1st 3 weeks prices declined quite steadily. The President's gold announcement turned the markets here towards firmer prices but, generally speaking, most of the oils lost ground in the month.

The markets were deluged with inquiries but actual sales were light. Prices undoubtedly were prevented from sinking to lower levels only because offerings were light.

An outstanding decline was that in corn oil, reflecting the weaker position of the grain prices. Interest centered in the possible effect the new processing corn tax would have and in most quarters, sentiment largely favored the strong possibility of higher levels within a very short period.

Another important news item was the final settlement of the fishing strike in California after several weeks in which the Monterey market has been dormant. Sales activity has also started in the San Pedro area. The Chicago lard and tallow market was depressed to very low figures in the 3rd week, but rallied somewhat near the close. Sale of a large number of tanks of crude manhaden at 12c in the Baltimore market was also reported in the 3rd week. This action apparently fixed the price at a much lower level than has prevailed for some time, although quotations at the higher levels were unquestionably largely nominal.

Tung Oil Shipments

August Hankow tung oil exports to U. S. amounted to 10,332,000 lbs., compared with 15,656,000 lbs. for the preceding month, and 7,404,000 lbs. for August, 1932. Total tung oil exports from Hankow in August were 13,172,000 lbs. compared with 17,982,000 lbs. in July.

Exports of tung oil to Europe amounted to 2,840,000 lbs., a gain of 514,000 lbs. over previous month and an increase of 912,000 lbs. over corresponding month of 1932. Stocks at Hankow Aug. 31 totaled 4,180 short tons.

Tabulation shows detailed statistics of tung oil exports to all countries and to U. S. from Hankow for the comparative months and for the 1st 8 months of 1932 and 1933. Total exports to U. S. for 1st 8 months of 1933 greatly exceeded quantity shipped for same months of 1932. While total exports of oil from Hankow during August were less than for May, June and July, total quantity was greater than for any monthly total registered in 1932.

	Total exports lbs.	*United States, lbs.*	*Hankow stocks short tons*
August, 1933	13,172,000	10,332,000	4,180
July, 1933	17,982,000	15,656,000	2,970
August, 1932	9,332,000	7,404,000	700
Jan.-Aug., 1933	108,190,000	86,218,000	....
Jan.-Aug., 1932	73,294,000	56,850,000	....

Clover Cotton Oil & Ginning plant at Clover, S. C., has been purchased by John T. Stevens interests of Kershaw, S. C.

Soap

Colgate-Palmolive-Peet has increased wages 20% affecting 1,500 workers, restoring pay to July 15, 1929 levels . . . Prouty Bowler Soap, Des Moines, is now making toilet soaps in addition to laundry soaps . . . P. & G. and Colgate-Palmolive-Peet cut laundry soaps 20c a case. Yellow bar laundry was reduced 15c . . . P. & G. is calling on Jan. 1 remaining $8,521,000 of the 4½% debentures due 1947. Call price is 105 and accrued interest.

New Feldspar Producer

Producer of "Bon Ami"—the Orford Soap, Manchester, Conn., is planning to start feldspar mining operations at Little Switzerland, N. C., with W. W. Robinson in charge.

Cottonseed Statistics*

	On hand Aug. 1	*Produced Aug. 1 to Sept. 30*	*Shipped out Aug. 1 to Sept. 30*	*On hand Sept. 30*
Crude oil, lbs.—				
1933-1934	*51,269,417	230,332,144	171,673,286	*119,580,165
1932-1933	29,523,581	218,890,135	173,263,932	103,203,919
Refined oil, lbs.—				
1933-1934	†676,331,574	‡135,682,901	.....	†622,798,885
1932-1933	628,420,148	119,514,181	.....	503,352,357
Cake and meal, tons—				
1933-1934	160,874	339,483	242,100	258,257
1932-1933	114,656	327,115	239,848	201,923
Hulls, tons—				
1933-1934	76,686	209,822	140,064	146,444
1932-1933	162,773	205,881	166,133	202,521
Linters, running bales—				
1933-1934	70,786	128,326	85,001	114,111
1932-1933	235,521	108,698	116,571	227,648
Hull fiber, 500-lb. bales—				
1933-1934	985	6,035	3,728	3,292
1932-1933	4,138	938	1,093	3,983
Grabbots, motes, etc., 500-lb. bales—				
1933-1934	3,216	5,082	3,786	4,512
1932-1933	15,250	3,192	3,549	14,893

*Includes 4,274,646 and 13,464,606 lbs. held by refining and manufacturing establishments, and 14,320,860 and 14,782,790 lbs. in transit to refiners and consumers August 1, 1933, and September 30, 1933, respectively. †Includes 5,498,953 and 5,799,546 lbs. held by refiners, brokers, agents, and warehousemen at places other than refineries and manufacturing establishments, and 12,642,917 and 6,708,949 lbs. in transit to manufacturers of lard substitute, oleomargarine, soap, etc., August 1, 1933, and September 30, 1933, respectively. ‡Produced from 148,395,756 lbs. of crude oil.

Exports for One Month Ended August 31

		1933	*1932*
Oil, crude	lbs.	11,452	74,310
Oil, refined	lbs.	304,289	683,435
Cake and meal	tons of 2,000 lbs.	2,231	3,030
Linters	running bales	15,179	10,606

*Cotton crop estimate Nov. 1, 13,100,000 bales, an increase of 215,000 over October.

Trend of the Cottonseed Oil, Cottonseed Meal Markets

Futures	*N. Y. Produce Exchange Bleachable Prime Summer Yellow*					*Memphis Cottonseed Meal**				
	Oct. 6	*Oct. 13*	*Oct. 20*	*Oct. 27*	*Close Oct. 31*	*Oct. 6*	*Oct. 13*	*Oct. 20*	*Oct. 27*	*Close Oct. 31*
			Tanks c per lb.							
Oct.	4.50—4.75	3.95	3.90			16.00—16.50	14.50—15.25	16.50—18.00		
Nov.	4.62—4.70	4.05—4.20	4.00—4.15	4.35—4.55	4.30—4.50	16.75—17.00	15.00—15.50	16.95—17.75	18.10f	18.00
Dec.	4.69—4.75	4.21—4.29	4.20—4.27	4.52—4.58	4.50—4.55	17.00—17.75	15.75	17.80—18.25	19.25f	19.10—19.25
Jan.	4.76—4.84	4.29—4.35	4.28	4.63—4.68	4.60—4.70	17.40—18.00	16.00—17.00	18.00—18.65	19.50—19.75	19.40—19.75
Feb.	4.78—4.90	4.30—4.45	4.30—4.45	4.65—4.85	4.65—4.80	17.90—18.65	16.40—16.75	18.50—19.50	19.80—20.25	20.00
March	4.98—5.03	4.54—4.61	4.52—4.58	4.86	4.82—4.87	19.00—19.25	17.00—17.25	19.00—19.50	20.40—20.75	20.35—20.60
Apr.	5.00—5.15	4.60—4.70	4.55—4.65	4.85—5.05	4.85—5.00	19.50—20.00	17.50—18.00	19.35—20.00	20.85—21.25	20.80—21.50
May	5.11—5.15	4.70	4.70	5.03	5.00—5.03	19.75—20.50	17.50—18.50	19.75—20.50	21.25—21.75	21.25—21.60
Total Sales Contracts for week	172 (74 switches)	163 (18 switches)	182 (12 switches)	184 (44 switches)		7,900	8,200	7,100	10,600	
Spot prime summer yellow week high-low	4.50	3.95	3.85—4.00	3.90	Nom.					
Crude, Southeast.	3.25—3.37½	3.12½	3.00	3.50	3.50†					
Valley	3.12½—3.25	3.00	3.00	3.50	3.50					
Texas	3.12—3.25	2.87½	2.75	3.25	3.25‡					

f flat; *closing price on Fridays of the month; †bids; ‡nominal.

Solvents, Petroleum Chemicals

Production and Price Control

Interest of the petroleum industry centered in the meeting of the A. P. I. in Chicago in the last week of the month. Secretary of the Interior and Federal Oil Administrator Ickes told members that stricter observance of the allowables would have to be obtained shortly or he would be forced to stringent methods of enforcing the prescribed quantities. A tentative allowable figure of 2,130,000 bbls. has been set for December and January, a decline of 108,500 from October's figure. Accompanying crude production figures indicate how much excess was produced in October.

Report of crude stocks issued Nov. 2 does show some improvement in curtailment, however, and Secretary Ickes seemed encouraged with the slight progress. Stocks on hand on Oct. 28 amounted to 344,626,000 bbls., of which 342,231,000 were domestic and 2,395,000 foreign oil. Stocks on Aug. 31 amounted to 356,634,000 bbls. a gain of 5,540,000 bbls. when comparison is made with Aug. 1.

Grade	*Stocks Oct. 28*
Pennsylvania	5,452,000
Other Appalachian, including Kentucky	1,024,000
Lima-N. E. Indiana-Michigan	1,385,000
Illinois-S. W. Indiana	10,906,000
N. Louisiana and Ark.	12,295,000
W. Texas-S. E. New Mexico	32,414,000
East Texas	47,155,000
Other Mid-Continent	151,670,000
Gulf Coast	16,847,000
Rocky Mountain	27,233,000
California	35,850,000
Total domestic crude	342,231,000
Foreign crude	2,395,000
Total crude	344,626,000

Total daily production of crude petroleum during December and January was set at 2,130,000 barrels by Secretary of Interior Ickes Oct. 24 through authority vested in him as Administrator of the oil industry code.

*Prices were $\frac{1}{16}$c higher on Nov. 1.

Important Price Changes

ADVANCED

	Oct. 31	Sept. 30
Cleaners' Naphthas, tanks, Group 3	$0.06½	$0.06⅜
Lacquer Diluents, tanks, Group 3	.07½	.07⅜
Petroleum Thinners, tanks, Group 3	.05	.04⅞
Rubber solvents, tanks, Group 3	.06¼	.06⅛
Stoddard Solvent, tanks, Group 3	.05¾	.05⅝
V. M. & P. Naphthas, tanks, Group 3	.06	.05⅞

State allocations from the total daily allowables are to be made by the Administrator Nov. 20. During that interim, the Petroleum Administrative Board of the Dept. of Interior will accumulate further statistics concerning changes in trade channels for petroleum and its products, upon which the State quotas are to be based.

Despite this rather gloomy picture of the industry important strides really have been made towards cutting down production. This caused a general increase in tankcar prices in Group 3 territory. Shipments, however, were off from the previous month.*

Tank-wagon prices in the cities where such service is maintained remained unchanged.

	Cleaners' naphtha	*Stoddard solvent*	*Petroleum thinner*	*V.&M.P naphtha*
Mid West				
Chicago	15.0c	15.0c	13.9c	15.9c
Decatur	17.6	17.6	16.3	17.8
Des Moines	17.7	15.6	17.3	18.8
Kansas City	16.3	14.3	14.0	15.5
Milwaukee	21.8	18.5	19.5	21.0
Minneapolis	22.1	17.8	19.8	21.3
St. Paul	22.1	17.8	19.8	21.3
St. Louis	17.0	14.0	14.7	16.2
East & South				
Boston	....	....	....	14.0
Newark	11.5	12.0	12.0	11.5
New York	11.5	12.0	....	11.5
New Orleans	11.0	11.0	....	....
Phila.	....	14.0	....	....

Solvent market generally failed to show any improvement in demand, and, in fact in most items, noticeable declines took place. The drop in the rate of automobile production (slightly under 200,000 units in September as against 135,000 units estimated for October) caused lacquer producers to slow up operating schedules. Akron reports indicate sharp curtailment in tire production. A better demand for ethyl acetate by rayon producers helped to offset loss in lacquer.

So far '34 contract solvent prices are unknown. Indications, it is reported, point to higher butyl alcohol prices and the announcement of a corn processing tax would seem to add strength to this belief.

Denatured alcohol shipments have been very satisfactory. A sudden cold snap in October helped to move material out into the hands of consumers. Prices are being very firmly held.

Crude Oil Production, October

	Federal Agency Allowable Effective Oct. 1	*Actual Production Week Ended Oct. 28, 1933*	*Week Ended Oct. 21, 1933*	*Week Ended Oct. 14, 1933*	*Week Ended Oct. 7, 1933*	*Total 4 Weeks*
Oklahoma	495,000	471,050	519,800	507,250	478,800	1,976,900
Kansas	116,000	111,750	114,300	112,250	116,000	444,300
Panhandle Tax	.....	45,200	47,100	45,100	47,350	184,750
North Texas	.....	53,300	56,400	57,750	53,150	220,600
West Cent. Tex.	.....	23,400	23,500	23,450	22,050	92,400
West Texas	.....	122,000	126,150	127,650	127,600	503,400
East Cent. Tex	.....	44,400	45,300	45,650	45,700	181,050
East Texas	.....	464,600	482,000	476,900	480,050	1,903,550
Conroe	.....	73,650	74,450	74,300	72,650	295,050
Southwest Texas	.....	47,850	49,350	47,800	45,750	190,750
Coast, Tex. (not incl. Conroe)	.....	112,250	112,400	111,350	111,300	447,300
Total Texas	965,000	986,650	1,016,650	1,009,950	1,005,600	4,018,850
North Louisiana	.....	26,250	25,950	25,850	25,600	103,650
Coast. Louisiana	.....	48,200	47,900	47,200	47,750	191,050
Total Louisiana	70,000	74,450	73,850	73,050	73,350	294,700
Arkansas	33,000	32,850	32,950	32,900	33,000	131,700
Eastern (not including Mich.)	94,200	96,450	98,900	98,550	98,350	392,250
Michigan	30,000	29,800	29,250	30,700	32,800	122,550
Wyoming	30,050	29,850	30,450	30,350	31,500	122,150
Montana	6,450	6,700	6,450	6,300	6,550	26,000
Colorado	2,400	2,450	2,400	2,450	2,400	9,700
New Mexico	41,400	41,950	42,000	42,000	42,000	167,950
California	457,000	474,200	467,500	473,900	478,500	1,894,100
Total	2,338,500	2,358,150	2,434,500	2,419,650	2,398,850	9,611,150

Now 3% Alcohol Fuels

Alcohol-blended fuel advocates have returned to the "wars" with a new suggestion of a 3% mix instead of the 10% formerly advocated in the interests of the corn and wheat farmer. With the Administration still confronted with the critical necessity for higher grain prices to achieve which Secretary of Agriculture Wallace recently stated calls for a "sympathetic re-examination of every remedy and each device, including those which orthodox economists would reject impatiently," the proposal again has been brought forward with renewed vigor.

Considerable agitation is now prevailing that the proposed 3% content of alcohol should come from wheat rather than corn. Adherents of the idea claim that "Sustain wheat prices and this bellwether grain will bring up the price of other grains, and at the same time the pressing problem of consumption of our wheat surplus will be taken care of."

Rossville Commercial Alcohol's offices (now a Commercial Solvents subsidiary) are at 230 Park ave., N. Y. City.

Hercules "Daintex" Wins

Each year the Direct Mail Advertising Association selects, from among the entries submitted, the 50 best direct mail campaigns. These are called the Fifty Direct Mail Leaders for the year, and are exhibited throughout the U. S.

Among the 50 leaders selected for 1933 was the Daintex series of 11 direct mail letters sent to laundries during the past year.

First 6 letters of this series carried appropriate cartoons on a fold at the top of the letter. Three other letters of the series enclosed blotters on which cartoon strips were printed. A miniature letter was one of the features of this series and attracted favorable attention and comment.

Daintex, is sold by Naval Stores Dept. of Hercules Powder.

Paints, Lacquers and Varnish

Code Signed!

Presidential approval of the paint, varnish and lacquer code Oct. 31 was announced on the floor at the 1st meeting of the newly formed National, Paint, Varnish and Lacquer Association brought into existence to succeed the American Paint & Varnish Manufacturers' Association, and the National, Paint, Oil and Varnish Association. For many years such amalgamation has been talked of and dismissed for 1 reason or another. NRA and 1933 have worked the "miracle."

Ernest T. Trigg, who headed the industry's code committee, was chosen to lead the new organization; H. A. Melum, Benjamin Moore & Co., is vice-president.

Major happenings of a busy week may be briefly summarized as follows: a constitution and by-laws were adopted; setup now gives the paint and allied industries a united front and a responsible united leadership; constitution establishes an executive committee to be composed of the officers and 18 men representing all manufacturing elements; Constitution creates 2 super-committees—trade sales committee and industrial sales committee —which will become powerful national bodies, headed by and composed of experts.

City and regional associations are an integral part of the national association and will become increasingly important factors. Federation of Paint and Varnish Production Clubs, plant managers, superintendents and technical men, which held its convention in Chicago, Oct. 26 to 28, elected Francis C. Atwood, Boston, president.

Slightly Better Business

Paint, lacquer and varnish sales continued to expand slowly, if at all, in October. Publicly-financed projects are finally getting to the stage where their effects are being felt by the paint field.

According to F. W. Dodge Corp. statistics September contracts amounted to $122,615,700, a gain of practically 16% over August total of $106,131,100, and slightly below September, 1932, total of $127,526,700. Cumulative total for 1st 9 months amounted to $743,553,300, as compared with $1,057,363,200 for the corresponding period of 1932. Largest gain in September over August occurred in public works with a month's total of $57,323,800 compared with $32,002,500 for August. This increase was due largely to additional contracts for highways.

Non-residential building amounted to $37,977,300, compared with $32,796,600 for August, and $35,997,400 for September of last year.

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Aluminum palmitate	$0.19	$0.18
Aluminum stearate	.17	.16
Barytes, Italian	29.00	27.00
Barytes, Russian	13.00	11.50
Calcium palmitate	.19	.18
Calcium stearate	.17	.16
Magnesium palmitate	.21	.20
Magnesium stearate	.19	.18
Talc, Canadian	23.00	22.00
French	23.00	20.00
Italian	70.00	60.00
Vermilion	1.39	1.36
Zinc palmitate	.20	.19
Zinc stearate	.18	.17
DECLINED		
Casein, standard	$0.12½	$0.14
80-100 mesh	.13½	.15
Litharge	.06¾	.07
Orange Mineral	.10½	.10¾
Red lead	.07¾	.08

Residential building started during September amounted to $23,889,300, compared with $21,937,000 for August, and $22,803,900 for September, 1932.

A somewhat better demand for paint-making chemicals appeared in October. Stearate prices were finally advanced after several weeks of rumors of higher prices. Palmitates were increased in the usual proportion. After several months of steadiness the lead pigments broke. A later ¼c rise partially offset the earlier ½c decline in litharge, red lead and orange mineral. Casein was weak, largely due to immediate poor demand. Price adjustments in imported grades of barytes and talc were finally made to compensate for the lessened value of the dollar when expressed in terms of foreign currencies.

Trade talk centered on 1934 contract prices. Rumors were about that carbona black producers were considering a 1c advance (export price was increased 1½c). Consumers were said to be accumulating sizable inventories, particularly the tire companies, despite the fact that Akron production is reported to be only a little more than 35% of capacity.

Demand for lacquer raw materials declined in anticipation of a much lower rate of automobile production over the balance of '33.

Generally speaking, the contract situation is dead-locked with producers unwilling at this time to announce half-yearly or yearly contract prices and consumers preferring to wait future developments.

Linseed Prices Weaken

Both flaxseed and linseed prices declined in October. In common with other commodities flaxseed lost ground up to the 3rd week and then turned firmer following the presidential radio address on Sunday evening, Oct. 22.

Census Bureau announces that, according to preliminary figures, there were 24 mills in U. S. which crushed flaxseed during quarter ending Sept. 30, 1933, reporting a crush of 170,064 tons of flaxseed and a production of 113,412,535 lbs. of linseed oil. These figures compare with 104,693 tons of seed crushed and 68,502,774 lbs. of oil produced for corresponding quarter in 1932; 213,083 tons of seed and 141,204,905 lbs. of oil in 1931; 164,834 tons of seed and 108,236,266 lbs. of oil in 1930; 288,983 tons of seed and 191,977,215 lbs. of oil in 1929; and 212,882 tons of seed and 141,888,625 lbs. of oil in 1928.

Stocks

Stocks of flaxseed at mills Sept. 30, amounted to 80,332 tons compared with 74,576 tons for same date in 1932, with 118,760 tons in 1931; with 94,730 tons in 1930; with 90,327 tons in 1929; and with 103,206 tons in 1928. Stocks of linseed oil reported by crushers were 65,797,839 lbs. on Sept. 30, 1933, compared with 65,863,475 lbs. for the same date in 1932, 76,150,682 lbs. in 1931, with 53,174,-

August Paint, Varnish and Lacquer Statistics

Sales of paint, varnish and lacquer products in August totaled $20,620,811 in value, according to a preliminary report by U. S. Bureau of Census from data supplied by 586 establishments. This compared with a revised total of $22,090,187 in July and $16,032,441 in August a year ago. January-August sales were $152,328,780 against $148,947,888 in the corresponding period of 1932. A record of August sales, a comparison with the preceding months of 1933 and the entire year 1932 follows:—

		Classified sales reported by 344 establishments				
		Industrial sales			*Trade sales of*	
1933	*Total sales reported by 586 establishments*	*Total*	*Paint and varnish*	*Lacquer*	*paint, varnish lacquer*	*Unclassified sales reported by 244 establishments*
1933—Jan.	$11,275,396	$3,529,886	$2,386,947	$1,142,939	$4,168,260	$3,577,250
Feb.	11,665,734	3,423,033	2,445,378	977,655	4,771,706	3,470,995
March	13,578,568	3,391,947	2,484,550	907,397	3,788,213	4,398,408
April	19,043,787	4,677,309	3,143,803	1,533,506	8,582,411	5,784,067
May*	26,241,044	5,991,938	4,298,455	1,693,483	11,788,573	8,460,533
June*	27,813,233	6,827,509	4,832,551	1,994,958	2,443,998	8,541,726
July†	22,090,187	6,406,184	4,493,516	1,912,668	8,627,400	7,056,603
August	20,620,811	6,323,475	4,754,701	1,568,774	7,840,359	6,456,977
1932—Jan.	$15,894,506					
Feb.	16,270,822					
March	19,089,005		Comparative data not available			
April	22,612,193					
May	24,981,441					
June	19,637,358	4,685,399	3,617,719	1,067,680	8,734,330	6,217,629
July	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
Aug	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
Sept	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
Oct.	15,592,377	3,996,500	3,036,323	960,177	6,610,011	4,985,866
Nov.	12,492,818	3,599,319	2,639,362	959,957	5,196,766	3,696,733
Dec.	9,484,520	3,222,770	2,186,706	1,036,064	3,506,715	2,755,035
Totals, yr.	$203,323,315	.....	.....	.....	.....	.....

*Revised.

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928 lbs. in 1930, with 82,991,738 lbs. in 1929, and with 78,623,882 lbs. in 1928.

Total flax production for 3 Canadian prairie Provinces for this year is estimated at only 574,000 bu. In Saskatchewan, which usually raises bulk of the crop, average yield this year was only 1.9 bu. per acre. During 2 previous years production in Canada has averaged about 2,500,000 bu. Prior to 1931 Canadian flax crops averaged better than 4,000,000 bu. It has seen a disastrous year for flax growers in Canada.

An Argentine estimate (Oct. 28) indicates that of the 7,163,000 acres sown to flaxseed this year, 10% must be crossed off because of abandonment due to unfavorable weather conditions. Argentine farmers are reported to be agitating for a minimum price on their grain.

Despite the lower levels for linseed the statistical positions of flaxseed and linseed remain strong. In most quarters advances were looked for particularly in view of the Government's attitude on higher price levels for commodities.

Personnel Changes

Thomas O'Conner, James B. Day & Co.'s chief chemist has resigned . . . Neil Cullinan is Breinig Bros.' new sales promotion manager . . . Robert E. Prince is now James B. Day & Co.'s superintendent . . . Harry Kramer, formerly with Acme White Lead, is again with the company in its lacquer division . . . Philip L. Maury, president, Arco Co., Cleveland paint manufacturer, has resigned.

Company News

Donovan Products, Rochester varnish and shellac company, filed voluntary bankruptcy petition Oct. 19 . . . Pacific Laboratories' new $15,000 addition will permit stepping up lacquer production from 1,500 to 2,000 gals. daily . . . Mid-Continent Paint & Lacquer Mfg. has purchased Southwestern Paint & Varnish . . . Brown Paint (Houston) has moved to larger quarters . . . Tousey Varnish (Chicago) has replaced buildings recently destroyed by fire with unit 125 x 80 ft. . . . Oregon Paint Products has a new red oxide deposit near Glendale, Ore . . . Fuller Varnish's plant was damaged by fire Oct. 23 . . . Continental Lacquer has started up operations at 511 S. Sharp st., Baltimore.

Industry Deaths

Theodore R. Stauf, 31, chemist for Peaslee Gaulbert Paint & Varnish, died Oct. 29. He was also president of the Louisville Paint & Varnish Production Club.

John R. Sullivan, 68, retired president, Black Diamond Paint & Varnish, Cincinnati, died Sept. 28 . . . Harry Stevens, 44, Columbia Varnish, Los Angeles, died Oct. 9 . . . Harry Schwartz, Capitol Paint & Varnish, B'klyn., committed suicide Oct. 4 . . . C. M. Athey, 72, president, C. M. Athey Paint, Baltimore, died Oct. 18. He was a founder of the Baltimore Paint, Oil & Varnish Club.

Arthur L. Somers, Fred. L. Lavanburg Co.'s secretary, married Miss Dorothy Steitz in Brooklyn Oct. 10. He is the youngest son of the late Arthur S. Somers.

Floyd S. Coates, formerly with Carter White Lead and National Lead, is with D. H. Litter Co.

Flaxseed Crop Oct. 1

(Three year comparison; also comparison with Sept. 1 report)

	Condition Oct. 1 (%) 10-year aver., 1921–			Condition Sept. 1 (%) 10-year aver. 1921–			Bushels—Harvested—5-year aver.	Bushels—Harvested—Revised	Bushels—Estimated Oct. 1	Bushels—Estimated Sept. 1
	1930	1932	1933	1930	1932	1933	1926–30	1932	1933	1933
Wis.	84	81	74	83	80	71	104,000	72,000	50,000	48,000
Minn.	82	74	54	80	72	49	6,566,000	5,704,000	4,365,000	4,092,000
Iowa	87	74	63	84	75	60	180,000	171,000	147,000	147,000
Mo.	75	75	70	81	69	70	15,000	11,000	11,000	11,000
N. Dak.	70	34	36	68	34	35	8,032,000	3,720,000	2,083,000	2,083,000
S. Dak.	74	43	11	69	41	15	3,374,000	776,000	97,000	97,000
Neb.	83	60	70	83	60	65	99,000	18,000	14,000	1,3000
Kan.	6.3	6.5	6.0	6.3	6.5	6.0	195,000	299,000	168,000	168,000
Mont.	64	38	31	64	42	26	1,367,000	998,000	428,000	342,000
Wyo.	78	42	45	74	47	38	78,00	18,000	8,000	8,000
U. S.	72.9	48.0	44.1	70.8	47.7	41.6	20,011,000	11,787,000	7,371,000	7,009,000

Flaxseed Prices in Primary Centers

	Minneapolis			Duluth			Winnepeg			Buenos Aires	
Week Ending	Cash	Dec.	May	Cash	Dec.	May	Cash	Oct.	Dec.	1933	1932
Close Sept. 30	.....	1.83½	.....	.....	1.83¾	.....	.....	.....	1.45¼	.....	.....
Oct. 6	1.80½	1.75½	1.79½	1.84	1.78	1.81	1.37	1.37	1.38	1.05¼	.63⅛
								May			
Oct. 13	1.71½	1.66½	1.71½	1.72	1.68	1.71	1.16½	1.22	1.17	.95¾	.63¾
Oct. 20	1.76½	1.71½	1.76½	1.78½	1.74½	1.78	1.27½	1.35⅞	1.30¾	.91½	.62⅝
Oct. 27	1.81	1.76	1.81	1.80	1.78	1.81	1.36	1.44	1.37½	.98⅞	.62
Close Oct. 31	1.80	1.75	1.80	1.76	1.76	1.79	1.33⅝	1.40⅞	1.35¼	.99½	.61⅞
Net Gain or Loss for month	.....	– 08½	.....	.....	– 04¾	.....	.....	.....	– 10	– 04¾	.....
Close Oct. 31, 1932	.....	1.03	1.06	.....	1.03½	1.06¼	.....	.72⅞	.67¼	.....	.....

Minneapolis Linseed Oil and Meal Shipments

	Oil in Pounds		Meal in Pounds	
Week Ending	1933	1932	1933	1932
Oct. 6	1,516,986	1,290,913	1,652,870	3,051,658
Oct. 13	660,912	935,047	1,805,170	2,469,880
Oct. 20	520,225	1,196,155	1,896,485	2,469,547
Oct. 27	366,643	859,462	1,924,145	2,691,989
Totals Sept. 29	5,152,648	7,317,712	6,280,751	14,337,992
Totals Oct. 27	7,691,628	11,599,289	14,185,236	25,021,066

Linseed Oil Prices, Minneapolis, London, San Francisco and Chicago

Week Ending	Minneapolis Carlots	Minneapolis Tanks	London Weekly Low	London High-Low* High	San Francisco Carlots	San Francisco Tanks	Chicago Carlots	Chicago Tanks	N. Y. City¶ Carlots	N. Y. City¶ Tanks
Close Sept. 30	10.5	10.1	19s	19s 7½d	11.0	10.4	10.5–10.7	9.9–10.1	10.3	9.7
Oct. 6	10.1	9.7	18s 6d	19s 4½d	10.8	10.2	10.3	9.7	10.1	9 5
Oct. 13	9.9	9.5	16s 9d	18s 6d	10.4	9.8	9.9–10.1	9.3–9.5	9.7	9.1
Oct. 20	9.5	9.1	16s 4½d	17s 3d	10.2	9.6	9.7	9.1	9 5	8 9
Oct. 27	9.5	9 1	17s 10½d	18s 3d	10.0	9.4	9.7	9.1	9 5	8.9
Close Oct. 31	9.5	9.1	19s†		10.0	9.4	9 7	9.5	9.5	8 9
Net Gain or Loss for month	–1.0	–1.0	....		–1.0	–1.0	– .8	– .8	– .8	– .8

*per cwt. †November shipment; Jan.-April, 19s 6d. Hull (England) linseed price Oct. 31—Plate, Oct. £10 per ton; Calcutta, Nov. £11⅞ per ton.

Domestic Flaxseed Receipts by Weeks

	Oct. 7		Oct. 14		Oct. 21		Oct. 28	
Week Ending	1933	1932	1933	1932	1933	1932	1933	1932
Minneapolis cars	89	155	60	143	49	78	26	77
Duluth cars	36	136	46	172	28	93	14	108
Winnipeg cars	4	23	9	55	19	32	8	55
Totals to date this crop*	2,240	4,419	2,355	4,789	2,451	4,992	2,499	5,232

*From Aug. 1.

Buenos Aires Flaxseed Shipments, Stocks

	Exports in Bushels*					Since January 1*					Since Jan. 1, 1932 (Last Year)					Total*		Visible Supply*	
Week Ending	U.S.	U.K.	Cont.	Orders	Others	U. S.	U.K.	Cont.	Orders	Others	U. S.	U.K.	Cont.	Orders	Others	1933	1932	1933	1932
Oct. 6	55	..	197	287	4	7,748	813	15,769	20,986	1,442	6,254	2,570	17,837	38,967	762	46,758	66,390	2,362	5,118
Oct. 13	575	..	75	51	..	8,323	813	15,844	21,037	1,442	6,274	2,590	18,303	39,217	762	47,459	67,276	2,362	4,724
Oct. 20	75	..	346	614	..	8,398	813	16,190	21,651	1,442	6,294	2,590	18,758	40,041	766	48,494	68,449	2,165	4,330
Oct. 27	20	..	272	370	20	8,418	813	16,462	22,021	1,462	6,294	2,637	19,333	41,080	766	49,176	70,110	1,969	3,937

*bushels, 000 omitted.

Indian Flaxseed Shipments

	Exports in Bushels*			Same Week Last Year*			Since Apr. 1, 1933			Since Apr. 1, 1932*			Total	Total
Week Ending	U. K.	Cont.	Others	U. K.	Cont.	Others	U. K.	Cont.	Others	U. K.	Cont.	Others	1933*	1932*
Oct. 6	376	...	...	4	60	8	5,444	2,284	388	204	1,104	196	8,116	1,504
Oct. 13	704	212	36	20	68	..	6,148	2,496	424	292	1,172	196	9,068	1,464
Oct. 20	28	..	..	..	44	20	6,176	2,496	424	292	1,216	216	9,096	1,724
Oct. 27	288	96	..	16	28	8	6,464	2,592	424	308	1,214	224	9,480	1,776

*000 omited.

WHAT IS IT?

PROPERTIES

1. Clear, water white, glass-like.
2. Neutral and anhydrous.
3. Water soluble; insoluble in organic solvents, oils, waxes, etc.
4. Twice as heavy as water.
5. Very viscous when melted. (49-110°C.)
6. Concentrated water solutions are not viscous.
7. Produces coatings not as brittle as silicate coatings.
8. When dissolved in water mixes with many oil and wax emulsions; water shellac, glue, gum and casein solutions and latex.
9. High surface tension; low penetration.
10. Not affected by acids or alkalies.
11. Precipitated by heavy metals.
12. Adhesive when wet.
13. Slightly hygroscopic, only at high humidity.
14. Crystallizes above 115° C.; forms a glaze on "firing."
15. Thermoplastic, exhibits slow "cold flow".

SUGGESTED USES

1. Greaseproofing and fire proofing paper, textiles, etc.
2. Coating, sizing and glazing paper, textiles, etc.
3. Adhesives and binders.
4. Indoor Water Paints.
5. Lubricant in oil or hydrocarbon lines.
6. Rustproofing and pickling metals.
7. Special textile detergents.
8. Prevention of adhesion of rubber materials.
9. Weighting of fibrous materials.
10. "Rubless" polish for rubber, leather, linoleum, etc.
11. Pigmented water finishes for leather.
12. Replacement of sodium silicate where alkalinity, discoloration, gelling or crystallization is undesirable.
13. May be rendered alkaline or acid with inorganic acids or alkalies for special uses.
14. Thickening rubber latex.
15. Hair "fixing" preparations.

STACOL

PRICE SCHEDULE (f. o. b. New York)

900 lb. drums	*90 lb. cans*	*9 lb. cans*
13c lb.	18c lb.	23c lb.

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Kansas City, Mo.—THOMPSON-HAYWARD CHEM. CO., 29th Southwest Boulevard — Valentine 2473
Los Angeles, Calif.—MARSHALL DILL, 2445 Hunter Street — Trinity 9575
New Orleans, La.—THOMPSON-HAYWARD CHEM. CO., 3114 Lowerline Street — Walnut 7252
Portland, Ore.—COOPER & CASE CO., Inc., 521 Kearney Steret — Worth 5465
San Francisco, Calif.—MARSHALL DILL, 510 Montgomery Street — Garfield 7526
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St. Louis, Mo.—G. S. ROBINS & CO., 310 S. Commercial Street — Main 5155
St. Paul, Minn.—HENRY L. BIERSACH, Pine and E. Kellogg Boulevard — Emerson 1098
Tulsa, Okla.—REFINERY SUPPLY CO., 621 East 4th Street — 4-8144
Buenos Aires, Argentine—W. H. GOETZ, Casilla 2382, Correo Central — 33 Avenida 5396
Habana, Cuba—J. M. SIERRA, Aguiar 73, Dpt. 710, Apartado 363 — A-9946
London, England—REX CAMPBELL & CO., Ltd., 7 Idol Lane, Eastcheap — Royal 8894
Paris, France—GENERALE INDUSTRIELLE, 41 Ave. Montaigne (8E) — Elysees 14-33
Toronto, Canada—CHARLES TENNANT & CO., Ltd., 372 Bay Street — Waverley 5688

Textile Chemicals

Dextrin & Starch Lower

Both dextrin and starch were subjected to 2 declines in October. First in each case was 2c and the 2nd amounted to 15c per 100 lbs. The 2c reduction was reported to be due to the lifting of the emergency freight rate charge. Decline in the price of corn was directly responsible for the 2nd. New schedule of dextrin grades is: corn, canary, $3.47 to $3.67 per 100 lbs.; white, $3.42 to $3.62 per 100 lbs.; British, gum, $3.74 to $3.94 per 100 lbs.

New starch schedule is: corn, pearl, $2.59 to $2.79 per 100 lbs.; powdered, $2.69 to $2.89 per 100 lbs.

Interest centered in the corn processing tax of 28c a bu. which became effective Nov. 5.* Corn refiners have appealed to the Government asking that suitable compensating taxes be placed on competing cane sugar and other items selling in direct competition with corn sugar, corn syrup, starches etc.

In connection with the processing tax it is expected that a reduction in '34 of the average corn acreage for the preceding 3-year period by at least 20% will be asked.

A number of the more important tanstuffs worked sharply lower. This was due in part to currency fluctuations and also to generally poorer demand. It is anticipated that operations in the tanning field will be noticeably contracted for the next 2 months. Two important price rises were noted, however, the carlot bbl. prices for spruce extract and super, each up a ¼c. Gambier, Singapore Cubes advanced a similar amount.

The serious strikes occurring in the textile centers of Paterson and Eastern Pennsylvania, in the Gloversville tanning district, and in several New England shoe centers caused shipments of dyestuffs, bichromate, sulfonated oils, sizing materials etc. to drop very noticeably. Contrasting with this the cotton and woolen centers were quite busy. With the strike situation seemingly on the way to final settlement the immediate tonnage outlook is brighter.

*Reduced, see page 433.

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Gambier, Singapore Cube	$0.06	$0.05¾
Spruce extract, bbls.	.01½	.01¼
Super, bbls.	.01⅞	.01⅝
DECLINED		
Corn starch, pearl	$2.59	$2.76
powdered	2.69	2.86
Dextrin, corn canary	3.47	3.64
white	3.42	3.59
British gum	3.74	3.91
Gambier, com.	.04	.04½
Mangrove bark	27.00	28.00
Myrobalans J1	31.00	32.00
J2	20.00	21.50
R2	20.00	20.50
Sumac, Sicilian, ship	66.00	67.00
Valonia	37.00	40.00
Wattle bark	30.50	32.00

Metals

Price trends in metals were confusing. Zinc held at last month's levels, but lead declined. Copper, after months of stability around 9c, weakened and declined to 7½c when large quantities were offered by leading producers in an attempt to move stocks and to test out buying sentiment. In the last week the red metal regained some lost ground and closed around 8¼-8½c. The possibility of an international agreement still is a trade factor. Producers were largely interested in discussion of a code. Both tin and silver regained in the last part of the month losses sustained in the 1st 3 weeks. Antimony was off and mercury held at the September figure, in spite of light demand. The exchange situation and the renewal of the mercury cartel were 2 factors largely responsible for this strength.

Glass

American Ceramic Society president, Dr. J. C. Hostetter, spoke Oct. 17 before British Society of Glass Technology . . . American Plate Glass (recently organized with $500,000 capitalization) will start operations at Durant City, Pa . . . Owens-Illinois net for year ended Sept. 30 amounted to $3.86 a share against $1.68 in previous 12 month period.

Chemical Specialties

A chemical specialty receiving wide attention in the past month is "izen." It is being marketed by Prior Laboratories, Inc., an affiliate of H. B. Prior & Co., Graybar Bldg., N. Y. City. Material is said to have exceptional waterproofing properties. It not only waterproofs, but also stain-proofs natural fabrics. It is said to aid in preserving the life of the cloth and to eliminate 75% of the laundry and dry-cleaning problems. It is colorless, odorless after treatment, non-explosive, stain-proof. Demonstrations have been conducted for a number of textile mills and it is before the *Good Housekeeping* Institute. Present marketing plans have not been completely decided upon as yet, but it is likely that it will be sold in bulk to textile manufacturers for original treatment of their goods and also merchandized in small packages through retail channels.

Raymond Foster will retire Jan. 1 from the Bayer Co. after 46 years service, and from all of his present business connections. He is president, Cook Laboratories; president, Antidolor Co.; president, 3-In-One Oil Co.; president, Proprietary Agencies; vice-president, Bayer Co.; vice-president, Phillips Chemical; member of the executive committee, Sterling Products. He was formerly president, Winthrop Chemical, and a director of Metz Laboratories.

John C. Paul, 79, Chicago metal polish manufacturer (Burnishine Brand) died Oct. 15 . . . J. Ferdinand Thompson, 81, Rockland, Mass. manufacturer of shoe blacking, died Oct. 7. He was in the chemical specialties business for 50 years.

C. W. Parker, Des Moines automobile polish manufacturer has moved into larger quarters.

Weekly Metal Statistics

	Lead Weekly High-Low			*Zinc Weekly High-Low*			*Copper Weekly High-Low*		*Tin Weekly High-Low*		*Silver Bullion Weekly High-Low*	
Week Ending	*E. St. Louis*	*N. Y.*	*London per ton*	*E. St. Louis*	*N. Y.*	*London per ton*	*Conn. Valley Base*		*Straits*	*Standard*	*N. Y.*	*London (in Pence)*
Close Sept. 30	.0435	.0450		.0475	.0510		.09		48.25	46.80	39⅝	18⅞
Oct. 6	.0435	.0450	£12 2s 6d £11 17s 6d	.0475	.0512– .0510	£16 17s 6d £16 12s 6d	.08¾–.09		49.00–48.40	47.87–47.30	39⅞–39⅝	18½–18⅝
Oct. 13	.0435	.0450	£11 17s 6d £11 16s 3d	.0475	.0512– .0510	£16 15s £16 10s	.08		48.375–47.50	47.35–46.50	39 –37½	18½–18⅝
Oct. 20	.0435–.0385	.0450–.04	£11 17s 6d £11 7s 6d	.0475	.0512– .0510	£16 10s £15 16s 3d	.07½–.09		46.875–46.00	46.00–45.20	36⅝–36¼	18⅛–17¾
Oct. 27	.0415–.0385	.0430–.04	£12 1s 3d £11 7s 6d	.0475	.0512– .0510	£16 £15 11s 3d	.08¼		48.75–47.10	48.00–46.30	38⅝–36⅞	18⅝–18⅛
Close Oct. 31	.0415	.0430	£11 12s 6d	.0475	.0512	£15 17s 6d	.08¼		48.87	48.00	39⅜	18¼
Net Gain or Loss for month	–.0020	–.0020			+ .0002		–.00¾		+ .62	+1.20	–¼	–⅝
Close Nov. 1, 1932	.0285	.03		0305	.0340		.05¼		23.50	22.70	27⅛	
1933 High-Low		.0450–.03		.05–.0260	.0535– .0295		.09–.05		48.00–21.75	47.0–21.10	40½–24½	20½d– 16½d

Zinc dust prices; there is a differential of $.02 per lb. for carlots above St. Louis zinc market; 5 tons to carload, $.0275; less than 5 tons $0.325.*

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Chloroform
Carbon Tetrachloride
Dichlorethylene
Trichlorethylene
TRICLENE*
Perchlorethylene
Tetrachlorethane
Pentachlorethane
Hexachlorethane

For dry-cleaning, metal degreasing, extraction of oils, general solvent use.

CYANIDES

CYANEGG* (Sodium Cyanide 96-98%)

For steel treating, electroplating, fumigation.

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Cyanide-Chloride Mixture, 45%
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DUOZINC* (Zinc-Mercury)
Electrotinning (Sodium Stannate-Acetate)
Gold and Silver Cyanides
Copper Cyanide

For ornamental and protective coatings on metal parts.

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Reactive chemical for industrial and laboratory work.

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*Reg. U. S. Pat. Off.

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Diortho Tolyl Guanidine
Triphenylguanidine
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ARSENIC, RED
BARIUM CHLORIDE
BARIUM HYDRATE
BICHROMATE
Soda and Potash
CHROMIC ACID
FORMIC ACID
NICKEL SALTS, SINGLE AND DOUBLE
NICKEL CHLORIDE
NITRITE SODA
OXALIC ACID
OXALATE AMMONIA
OXALATE POTASH
BINOXALATE POTASH
CAUSTIC POTASH
CARBONATE POTASH
PERMANGANATE POTASH
RED PRUSSIATE POTASH
SODA ACETATE
SODA ASH
SODA BICARBONATE
SODA CAUSTIC
SODA SILICO FLUORIDE
ACID SODA FLUORIDE
SODA FLUORIDE
SODA PYROPHOSPHATE
STEARATES
Aluminum, Calcium, Magnesium and Zinc
SULFUR CHLORIDE
TRISODIUM PHOSPHATE

For general chemical use.

REFRIGERANTS

ARTIC* (Methyl Chloride)

For fractional tonnage refrigeration.

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Gold and Metallic Decorations
Liquid Lustre Colors
Glazes
Stains
Oxides and Fluxes

For decorating glass, china, tile, terra-cotta, porcelain.

CERAMIC MANUFACTURE

Feldspar
Chemicals and Oxides

For making glass, pottery, enamels.

PEROXIDES

ALBONE* C (Hydrogen Peroxide, 100 Vol. Electrolytic)
SOLOZONE* (Sodium Peroxide)
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Calcium Peroxide
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The Financial Markets

Stocks Again Lose Ground

Stocks again declined in October. The 240 stocks in the *N. Y. Times* Index declined $1,706,298,462 or 9%, despite a late rally in the closing days of the month. Aside from a slight bullish sentiment in the final week and a brief spell of advancing prices early in the month the 30-day period was not 1 to inspire a great deal of confidence, if the stock market is taken as a sole barometer. Selling was not aggressive, however, and trading was extremely light. Chemical group (9 leading common stocks) declined 3.25 points. All groups showed losses.

With the loss for October included, $5,951,464,714, or 49%, of the appreciation in values of the *N. Y. Times* compilation from March 1 to the end of June has been canceled in the last 4 months. Market values at the end of October were 66% below those at the end of September, 1929.

Loss in value in the chemical group amounted to $99,349,903 compared with a net loss of $128,228,866 in September. The changes in the 9 issues in October were as follows:

		Declines
Allied Chemical & Dye	2,401,288	$21,911,753
Commercial Solvents	2,638,187	11,212,295
Du Pont de Nemours	11,065,685	17,981,738
Mathieson Alkali Wks	650,436	325,218
Texas Gulf Sulphur	2,540,000	2,540,000
Union Carbide & Carb	9,226,937	42,674,583
U. S. Industrial Alcohol	391,238	2,053,999
Virginia-Carolina Chem.	481,222	60,153
Westvaco Chlorine Prod.	214,605	590,164
Total		—$99,349,903

One particularly bright spot in the picture, however, was the splendid improvement in 3rd quarter statements issued by most of the leading companies. These reflect better tonnage moving into industry. The Street is also quite likely to view with satisfaction the generally higher chemical prices for 1934 contracts.

Consolidated Chemical Sale

Testifying in the U. S. District Court in Trenton, N. J., on Oct. 25, Edward Clymer, former trust officer of National Security Bank and Trust of Philadelphia, said he had been a "straw man" in a transaction in which property of Miner Edgar Chemical Corp. was sold to Consolidated Chemical Corp. in 1930 for $1. He was a witness in suit brought by John N. Charnock of West Virginia, trustee in bankruptcy for Miner Edgar Corp., who seeks an accounting of the assets of the company from Consolidated Chemical, now in receivership, and the National Bank of New Jersey of New Brunswick.

Mr. Clymer asserted that he "had signed papers" at the direction of a superior and that he had never attended a meeting, had never had a share of stock in his personal account and "never got a nickel out of either company."

A Bitter Fight

Extension until Nov. 15 of injunction against V.-C. directors was granted Oct. 26 by Judge William A. Moncure in Richmond city chancery court after a 3-day hearing on the petition filed by Alfred Levinger of N. Y. City, who is contesting validity of the recent election. Judge Moncure extended order on Oct. 31, in order to have an opportunity to study the mass of evidence presented at the hearing.

Standard Phosphate & Acid has paid 1½% dividend on its capital stock. Dividend has been earned.

Over the Counter Prices

	Aug. 31		Sept. 30		Oct. 31	
American Hard Rubber	13	16½	8	12	8	12½
Dixon	45½	50	40	48	37	42½
Merck, pfd	98½	101½	98	101½	101½	105½
Worcester Salt	48	53	..	..	47½	53
Young, J. S. pfd	84	..	82½	..	82½	..
Young, J. S.com	58½	..	59	..	57½	..

Foreign Markets

London	Aug. 31	Oct. 2	Oct. 31
British Celanese	16s 6d	15s 3d	15s 6d
Celanese	£10	£9¼	£8⅝
Courtaulds	£2	£2	£2⅛
Distillers	83s 9d	82s 6d	82s 9d
I. C. I.	29s 7¼d	29s 9d	30s 3d
Un. Molasses	14s	13s	13s 10¼d
Paris			
Kuhlmann	690	650	650
L'Air Liquide	810	770	760
Berlin			
I. G. Farben	120	116	116
Milan			
Montecatini	111½	119¾	119¾

Reorganization Planned

United Molasses' stockholders were informed Oct. 16 that directors plan to submit plan for reorganization and writing down of ordinary capital and a proposal for dealing with arrears of preference share dividends. Early in July company sold its entire shareholding in Dunbar Molasses Corp., and its associated companies including Rossville Commercial Alcohol Corp. In addition, marketable securities amounting to £125,000 were sold. This sale of assets, together with reduction in inventories, has enabled company to pay off a bank loan of £629,000 and indebtedness of £97,500 on account of a motor vessel.

Dividends and Dates

Name	*Div.*	*Stock Record*	*Payable*
Air Reduction ext.	$ .75	Sept. 30	Oct. 16
Air Reduction	.75	Sept. 30	Oct. 16
Allied Chem & Dye	$ 1.50	Oct. 11	Nov. 1
Amer. Home Prods	.20	Nov. 14	Dec. 1
Amer. Home Prods	.20	Oct. 14	Nov. 1
Am. Smelt. & Ref. 7% 1st pf	$ 1.75	Nov. 3	Dec. 1
Archer-Daniels-Midland pf	$ 1.75	Oct. 21	Nov. 1
Atlas Powd. pf	$ 1.50	Oct. 20	Nov. 1
Bristol-Myers Co., initial	.50	Nov. 15	Dec. 1
Bristol-Myers Co. ext.	.10	Nov. 15	Dec. 1
Canadian Indust. pf	$ 1.75	Sept. 30	Oct. 16
Chickasha Cotton Oil	.25	Oct. 2	Oct. 16
Clorox Chemical	.50	Dec. 20	Jan. 1
Colgate-Palm.-Peet pf	$ 1.50	Dec. 11	Jan. 1
Cons. Chem. Ind. pf A	.37½	Oct. 14	Nov. 1
Corn Prods. Ref	K1%	Sept. 29	Oct. 20
Corn Prods. ref pf	$ 1.75	Sept. 29	Oct. 16
Dow Chemical	.50	Nov. 1	Nov. 15
Dow Chemical pf	$ 1.75	Nov. 1	Nov. 15
du Pont deb	$ 1.50	Oct. 10	Oct. 25
Freeport Texas 6%	$ 1.50	Oct. 13	Nov. 1
Freeport Texas	.50	Nov. 15	Dec. 1
Freeport Texas pf	$ 1.50	Jan. 15	Feb. 1
Hercules Powder pf	$ 1.75	Nov. 3	Nov. 15
Int'l Nickel pf	$ 1.75	Oct. 2	Nov. 1
Int'l Printing Ink 6% pf	$ 1.50	Oct. 14	Nov. 1
Lehn & Fink	.50	Nov. 15	Dec. 1
MacAndrews & Forbes pf	$ 1.50	Sept. 30	Oct. 14
MacAndrews & Forbes	.50	Sept. 30	Oct. 14
Merck Corp. pf.	$ 2.00	Dec. 16	Jan. 2
Metal & Thermet	$ 1.00	Oct. 20	Nov. 1
Nat. Carbon pf	$ 2.00	Oct. 20	Nov. 1
Nat. Lead pfA	$ 1.75	Dec. 1	Dec. 15
Nat. Lead pfB	$ 1.50	Oct. 20	Nov. 1
N. J. Zinc	.50	Oct. 20	Nov. 10
Owens-Illinois Glass	.50	Oct. 30	Nov. 15
Owens-Illinois Glass ext	.25	Oct. 30	Nov. 15
Penn Salt Mfg	.75	Sept. 30	Nov. 1
Pittsburgh Plate Glass	.25	Dec. 9	Jan. 2
Proctor & Gamble	.37½	Oct. 25	Nov. 15
Proctor & Gamble 8% pf	$ 2.00	Sept. 22	Oct. 14
Shawinigan W. & P.	.12	Oct. 25	Nov. 15
Sherwin-Williams	.50	Oct. 31	Nov. 15
Sherwin-Williams pf	$ 1.50	Nov. 15	Dec. 1
Solvay Amer. Inv. pf	$ 1.37½	Oct. 16	Nov. 15
U. S. Smelt. Ref. & Mng	.25	Oct. 5	Oct. 14
U. S. Smelt. Ref. & Mng pf	.87½	Oct. 5	Oct. 14
Vulcan Detinning pf	$ 1.75	Oct. 6	Oct. 20

Annual and Special Meetings

	Record Date	*Meeting Date*
Liquid Carbonic	Nov. 16	Dec. 7
Spencer Kellogg	Oct. 14	Nov. 13
Texas Gulf Sulphur	Oct. 28	Nov. 28
United Dyewood (spec.)	Nov. 16	Dec. 7
V.-C. (adj. anneal)		Nov. 10

Ruhr Chemical Bond Payments

Ruhr Chemical, Oberhausen-Holten, Germany, has notified holders of its 6% sinking fund mortgage bonds, series A, that it has deposited with the German government's Conversion Bank for Foreign Debts the reichmark equivalent of the interest and sinking fund payments due on these bonds Oct. 1. This action was taken under a German law of June 9, 1933, which restricts transfer of funds out of Germany for the purpose of making payments of interest or amortization on outstanding foreign indebtedness.

Price Trend of Chemical Company Stocks

	Sept. 30	*Oct. 31*						*1933*	
	Close	*Oct. 6*	*Oct. 13*	*Oct. 20*	*Oct. 26*	*Close*	*Net Change*	*High*	*Low*
Allied	136¾	137¾	137½	128½	134	127⅝	—9⅛	145½	70¾
Air Red	103	102	102	93⅞	101¼	93⅝	—9⅜	112	47½
Anaconda	15⅞	15¾	14¼	11⅝	14⅜	13⅜	—2½	22⅞	5
Col. Carbon	51	52	53	49	53⅞	49	—2	71½	23⅛
Com. Solvents	35¾	38⅞	35⅞	32	33¼	31½	—4¼	57¼	9
Du Pont	75½	77	75⅜	71⅛	78⅛	73⅞	—1⅝	85¾	32⅛
Mathieson	37	40⅛	38⅜	34⅛	38¼	36½	— ½	43¾	14
Monsanto	63	66¼	64	55	64	63⅛	+ ⅛	74½	25
Std. N. J.	39¾	42⅛	41⅝	39⅜	41⅝	40⅜	+ ⅝	43⅞	22¾
Texas Gulf S.	36½	37¼	36	33½	38	36	— ½	41	15¼
U. S. I.	67	68	66½	66¼	65¼	61¾	—5¼	94	13½

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Church & Dwight, Inc.
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80 MAIDEN LANE NEW YORK

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Standard Quality

Earnings at a Glance

Company	Annual Dividends	Net Income 1933	Net Income 1932	Common Share Earnings 1933	Common Share Earnings 1932
Air Reduction Co.:					
Sept. 30 quarter	§$3.00	$1,037,402	$425,920	$1.23	$ .50
Nine months, Sept. 30	$3.00	2,137,324	1,667,130	2.54	1.93
Atlas Powder Co.:					
Sept. 30 quarter	f....	307,782	75,897	.74	p.83
Nine months, Sept. 30	f....	437,039	†78,500	.17	...
Barnsdall Corp.:					
Sept. 30 quarter	f....	†110,770	†108,701	...	...
Nine monthsSept. 30	f....	†1,946,069	†468,643	...	...
Com'l Solv. Corp.:					
Sept. 30 quarter	.60	642,317	305,562	h.24	h.12
Nine months, Sept. 30	.60	1,279,365	894,836	h.48	h.35
Consolid. Chem. Indus., Inc.:					
Sept. 30 quarter	a1.50	126,886	79,428	a.62	a.38
Nine months, Sept. 30	a1.50	302,295	236,748	a1.47	a1.15
Gen. Printing Ink Corp.:					
Sept. 30 quarter	f....	145,142	25,710	.47	p.64
Nine months, Sept. 30	f....	300,886	164,999	.69	p4.09
Hercules Powder Co.:					
Sept. 30 quarter	1.50	837,964	238,371	1.12	.09
Nine months, Sept. 30	1.50	1,731,015	538,587	2.02	5.06
Industrial Rayon Corp.:					
Sept. 30 quarter	4.00	571,792	†96,115	2.86	...
Nine months, Sept. 30	4.00	1,258,033	†210,928	6.29	...
MacAndrews & Forbes Co.:					
Sept. 30 quarter	2.00	236,9 36	y110,828	h.68	h.25
Nine months, Sept. 30	2.00	618,843	y378,039	h1.74	h.89
Monsanto Chemical Co.:					
Sept. 30 quarter	1.25	680,757	201,821	1.57	.47
Nine months, Sept. 30	1.25	1,519,704	736,042	3.51	1.71
National Distillers Prod.:					
Sept. 30 quarter	....	1,477,925	79,385	2.35	...
Nine months, Sept. 30	....	1,954,273	370,415	2.81	...
Newport Industries, Inc.:					
Sept. 30 quarter	f....	34,802	†91,855	...	...
Nine months, Sept. 30	f....	24,108	†227,439	...	...
Procter & Gamble Co.:					
September 30 quarter	1.50	4,383,840	.....	.64	...
Union Carbide & Carb. Corp.:					
Sept. 30 quarter	1.00	4,603,663	1,984,917	.51	.22
Nine months, Sept. 30	1.00	8,904,873	6,221,354	.99	.69

‡Plus extras; fNo common dividend; †Net loss; pOn preferred stock; aOn class A stock; yIncludes company's proportion of results of subsidiary operations; hOn shares outstanding at close of respective periods.

Du Pont Quarterly Earnings Higher

Du Pont and wholly owned subsidiaries for quarter ended Sept. 30, shows net income of $11,981,980 after depreciation, obsolescence, interest, federal taxes, etc., comparing with $8,974,743 in preceding quarter and $5,531,096 in September quarter of 1932.

After deducting debenture dividends and including $102,374 equity in undivided profits or losses of controlled companies not consolidated, there was a balance available for common in quarter ended Sept. 30, last, of $10,447,092 equivalent to 95c a share (par $20) on 11,048,311 average number of common outstanding during period. In preceding quarter, balance for common, including $114,554 equity in undivided profits or losses of controlled companies not consolidated, was $7,452,122 equal to 68c a share on 10,964,148 average common shares and in September quarter of 1932, balance for common, including $54,014 equity in undivided profit or losses of controlled companies not consolidated, was $3,952,717 or 36c a share on 10,838,799 average common shares.

For 9 months ended Sept. 30, net income was $26.437,238 after taxes and charges comparing with $19,733,517 in 1st 9 months of previous year. After deducting debenture dividends and including $194,991 equity in undivided profits or losses of controlled companies not consolidated, there was a balance for common in 1st 9 months of 1933 of $21,724,642 equal to $1.98 a share on 10,961,478 average common shares. In 1st 9 months of 1932, balance for common stock, including $73,108 equity in undivided profits or losses of controlled companies not consolidated, was $14,914,884 or $1.37 a share on 10,865,592 average common shares.

Earnings for September quarter this year include dividends from G. M. amounting to 22½c a share on du Pont common, comparing with 23c in preceding quarter and 23c in September quarter of previous year. For 9 months ended Sept. 30, 1933, earnings from G. M. investment amounted to 68½c a share on du Pont common, against 92c in 1st 9 months of '32.

Consolidated income account for 3 months ended Sept. 30, compares as follows:

	1933	1932	1931	1930
Oper inc	$12,342,407	$5,392,825	$9,314,821	.....
Depr & obsol	3,218,736	3,244,058	3,125,859	.....
Balance	$9,123,671	$2,148,767	$6,188,962	$4,834,721
Inc G. M. inv	2,499,362	2,494,666	7,487,465	7,487,465
Other inc	1,746,962	1,080,313	899,204	1,199,367
Total inc	$13,369,995	$5,723,746	$14,575,631	$13,521,553
Federal tax	1,370,590	175,151	755,007	470,057
Interest	17,425	17,499	18,075	18,151
Net income	$11,981,980	$5,531,096	$13,802,549	$13,033,345
Deb divs	1,637,262	1,632,393	1,596,495	1,493,028
Com divs	5,524,114	5,422,472	10,995,366	10,909,285
Surplus	$4,820,604	*$1,523,769	$1,210,688	$631,032

Consolidated income account for 9 months ended Sept. 30, compares as follows:

	1933	1932	1931	1930
Oper inc	$27,191,480	$16,781,819	$26,729,009	.....
Depr & obsol	9,646,744	9,771,113	9,284,841	.....
Balance	$17,544,736	$7,010,706	$17,444,168	$19,540,038
Inc G. M. inv	7,498,085	9,978,666	22,458,930	25,452,530
Other inc	4,166,425	3,461,272	3,425,045	3,224,740
Total inc	$29,209,246	$20,450,644	$43,328,143	$48,217,308
Fed tax	2,719,752	664,036	1,860,892	2,178,120
Interest	52,256	53,091	54,308	54,529
Net income	$26,437,238	$19,733,517	$41,412,943	$45,984,659
Deb divs	4,907,587	4,891,741	4,582,485	4,478,985
Com divs	16,435,370	24,503,963	33,124,121	35,076,146
Surplus	$5,094,281	*$9,662,187	$3,706,337	$6,429,528
Surp beg yr	178,717,373	198,933,044	208,082,665	144,920,215
Rev G. M. inv	.....	.....	.....	22,457,745
Surp adj	‡4,023,149	.....	3,120	†32,357,159
Total surp	$187,834,803	$189,270,857	$211,792,122	$206,164,647
Write-down G. M. inv	§14,500,000	§9,981,220	.....	.....
P & L surp	$173,334,803	$179,289,637	$211,792,122	$206,164,647

*Deficit. †Includes $7,767,060 surplus resulting from issue of common stock sold under executives' trust and bonus plans. $18,249,540 premium received from common stock issued under subscription offer and $6,340,559 surplus resulting from acquisition of R. & H. Chemical Co. ‡Resulting from disposition of common stock in treasury. §The value of du Pont company's investment in General Motors common stock was adjusted on the books of the company in March, 1932, to $168,682,618 ($16.90 a share) and in March, 1933, to $154,500,000 ($15.45 a share) which closely corresponded to its net asset value as shown by the balance sheets of General Motors at close of 1931 and 1932, respectively.

Mathieson Nets 60c In Past 3 Months

Mathieson reports for quarter ended Sept. 30, net income of $415,667 after depreciation depletion, federal taxes etc., equivalent after dividend requirements on 7% preferred stock, to 60c a share on 623,283 shares of no-par common. This compares with $330,841 or 46c a share on 623,308 common shares in preceding quarter and $126,409 or 13c a share on 650,436 common shares in 3rd quarter of previous year.

For 9 months ended Sept. 30, net income was $919,350 after taxes and charges, equal to $1.27 a share on 623,283 common comparing with $548,624 or 65c a share on 650,436 common in 1st 9 months of 1932.

	1933	1932	1931	1930
Oper profit	$764,518	$406 698	$711,119	$850,326
Dep & depl	284,480	285,481	287,872	310,612
Profit	$480,038	$121,217	$423,247	$539,714
Inc chgs (net)	8,703	*7,069	*10,267	*8,136
Total inc	$471,335	$128,286	$433,514	$547,850
Fed tax	55,668	1,877	46,258	58,022
Net inc	$415,667	$126,409	$387,256	$489,828

Nine months ended Sept. 30.

	1933	1932	1931	1930
Op profit	$1,899,434	$1,399,650	$2,005,428	$2,638,787
Depr & depl	852,419	857,415	857,617	893,541
Profit	$1,047,015	$542,235	$1,147,811	$1,745,246
Inc chgs (net)	18,968	*33,335	*32,152	*43,951
Total inc	$1,028,047	$575,570	$1,179,963	$1,789,197
Fed tax	108,697	26,946	117,157	191,735
Net inc	$919,350	$548,624	$1,062,806	$1,597,462

*Income credits.

Consolidated Chemical Industries, Inc., reports for 9 months ended Sept. 30, net profit of $302,295 after depreciation, federal taxes, etc., equivalent to $1.47 a share on 205,000 no-par shares of $1.50 Class A preferred stock. This compares with $236,748, or $1.15 a share, on Class A preferred stock in 1st 9 months of 1932. For quarter ended Sept. 30, net profit was $126,886 after charges and taxes.

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The Industry's Securities

Stocks

1933 October Last	1933 High	1933 Low	1932 High	1932 Low	Sales In October	Sales During 1933	Stocks	Par $	Shares Listed	An. Rate		Earnings $-per share-$ 1931	Earnings $-per share-$ 1930
NEW YORK STOCK EXCHANGE													
101¼	106½	93⅞	112	47½	63½	30⅞	33,600	626,200	Air Reduction	No	841,288	$3.00		4.54	6.32
131	144¼	118½	145½	70¾	88½	42⅝	99,000	2,328,600	Allied Chem. & Dye	No	2,401,000	6.00		6.74	9.77
125	125	123½	125†	115	120†	96½	900	26,700	7% cum. pfd.	100	393,000	7.00			
23½	27¼	20⅜	35	7¼	15⅝	3½	10,600	253,900	Amer. Agric. Chem.	100	333,000		Yr. Je. '30		Nil
50	65½	42	89⅞	13	27	11	207,100	2,399,900	Amer. Com. Alc. (new)	20	375,000				d1.27
24	26½	21⅞	29¼	9¾	15½	7	6,500	101,200	Archer Dan. Midland	No	550,000	1.00	Yr. Aug. 30		1.68
25	26	18	38⅛	9	25½	7*	5,800	129,600	Atlas Powder Co.	No	261,438			.59	2.67
...	79	75	83⅛	60	79½	45½	440	6,834	6% cum. pfd.	100	96,000	6.00			
53⅞	56½	45	71½	23⅛	41⅞	13½	24,400	86,850	Columbian Carbon	No	538,420	2.00		3.02	5.04
31⅜	40⅛	28⅛	57¼	9	13⅜	3½	1,206,500	6,832,500	Comm. Solvents	No	2,530,000	.60		.83	1.07
76	89⅞	73½	90⅝	45⅜	55⅜	24½	80,300	1,504,300	Corn Products	25	2,530,000	3.00		3.54	4.82
138¼	138¼	135⅝	145½	117½	140	99½	1,430	11,015	7% cum. pfd.	100	250,000	7.00			
76⅜	79	66⅜	85¼	32⅛	59¾	22	243,200	5,331,060	DuPont de Nemours	20	11,008,512	2.00		4.29	4.67
110¼	113½	110¼	117	97½	105⅛	80⅜	1,600	40,500	6% cum. deb.	100	1,098,831	6.00			
74⅛	80	67½	89¾	46	87¼	35¼	26,000	557,518	Eastman Kodak	No	2,261,000	3.00		5.78	8.84
127¼	127¾	125⅞	130	110	125	99	170	1,860	6% cum. pfd.	100	62,000	6.00			
43⅞	45¼	38⅜	47⅜	16⅜	28⅜	10	61,100	756,000	Freeport Texas Co.	No	730,000	2.00		3.26	w4.77
48	51	41½	63	15	29½	13⅜	10,300	242,900	Hercules Powder Co.	No	606,234	1.50		1.04	2.61
104⅜	108	104¼	110	85	95	70½	460	4,290	7% cum. pfd.	100	114,241	7.00			
2⅛	2⅜	1½	5⅜	⅞	3½	¼	5,300	158,600	Intern. Agric.	No	450,000		Yr. Je.'30		1.68
12⅛	12⅜	10	27½	5	15	3⅜	200	23,900	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30		14.58
18⅛	20⅜	16⅛	22⅜	6⅛	12½	3½	509,600	7,432,537	Intern. Nickel	No	14,584,000			.22	.67
15½	16⅜	12⅛	22	7½	11	8	2,800	66,000	Kellogg (Spencer)	No	598,000	.60			h1.14
23⅜	32⅛	20⅞	50	10⅛	22	9	45,800	821,900	Liquid Carbonic Corp.	No	342,000			2.96	5.22
38⅛	42¼	33	43⅜	14	20⅞	9	35,200	488,100	Mathieson Alkali	No	650,426	1.50		1.88	2.96
64	66⅞	55	74½	25	30⅜	13⅜	9,400	186,966	Monsanto Chem.	10	429,000	1.25		2.98	1.73
87	105⅝	81¼	105⅝	78½	27¼	13	702,350	4,679,350	National Dist. Prod. cts. (new)	No	252,000			—	1.23
128	128	120	130	43½	92	45	4,900	32,000	National Lead	100	310,000	5.00			7.58
127½	127½	125⅛	127½†	101	125	87	200	5,555	7% cum. "A" pfd.	100	244,000	7.00			
108	108	105	109⅛	75	105	61	300	3,430	6% cum. "B" pfd.	100	103,000	6.00			
4⅞	5⅜	3⅜	7¼	1⅜	4⅜	1	10,300	179,500	Tenn. Corporation	5	858,204	1.00			1.21
37¼	39⅜	31½	41	15½	26½	12	159,100	1,463,000	Texas Gulf Sulphur	No	2,540,000	2.00		3.52	5.50
39	45½	34⅜	51⅞	19½	36⅜	15½	168,700	2,365,500	Union Carbide & Carb.	No	9,001,000	1.20		2.00	3.12
25⅜	28	22⅜	30⅜	10½	18	6⅜	30,700	585,200	United Carbon Co.	No	398,000			—	1.43
63¼	73⅞	54½	94	13½	36½	13½	186,700	2,433,500	U. S. Ind. Alc. Co.	No	373,846			—	z2.96
18	23	14½	36¼	7⅞	23½	5½	54,800	1,206,900	Vanadium Corp. of Amer.	No	378,367				2.95
3½	3⅞	2½	7⅜	⅜	2⅜	½	6,300	351,000	Virginia Caro. Chem.	No	487,000		Yr. Je. '30		Nil
15½	18	11	26½	3⅜	11½	3⅜	1,900	81,200	6% cum. part. pfd.	100	213,000		Yr. Je. '30		2.63
57⅜	58	57½	63½	35⅜	69⅜	20	500	11,820	7% cum. prior pfd.	100	145,000		Yr. Je. '30		11.96
12¼	16	12½	20½	5	12⅜	1			Westvaco Chlorine Prod.	No		1.00		1.79	2.51
NEW YORK CURB															
10½	12⅜	8¾	15⅜	3¼	8½	1⅜	39,800	1,006,000	Amer. Cyanamid "B"	No	2,404,000			.21	
3⅝	4	3¼	4½	1	2⅜	¼	19,400	177,400	Brit. Celanese Am. Rcts.	2.43	2,806,000				
...	110	102	110†	27	55	8	3,350	29,344	Celanese 7% cum. part. 1st pfd.	100	148,000	7.00			
...	90	79½	90†	51	64½	17	1,475	10,920	" 7% cum. prior pfd.	100	115,000	7.00			
20	26⅞	18	26¼†	2	5⅜	1⅜	13,300	71,800	Celluloid Corp.	No	195,000				
...	10⅜	9⅜	10⅜†	4½	6⅜	4½	6,500	118,600	Courtaulds, Ltd.	1£					
...	70	58	78	30	39	21⅜	5,900	51,900	Dow Chemical	No	630,000	2.00			3.44
4	5¾	3⅜	8	½	1½	¼	5,200	56,600	Duval Texas Sulphur	No	500,000				
16⅜	17½	15½	19	8	...	...	700	5,900	Heyden Chemical Corp.	10	150,000	1.00			
...	6¼	6⅜	7	4½	2⅜	2½	500	1,650	Imperial Chem. Ind.	1£				1.21	
...	17	15¼	20⅜	8	20¼	6½	1,600	29,860	Shawinigan W. & P.	No	2,178,000	1.00			
CLEVELAND STOCK EXCHANGE															
...	...	...	24	22	25	21¾		811	Cleve-Cliffs Iron $5 pfd.	No	498,000	5.00		—	11.42
68	68½	65	78	30	40	21½	1,060	13,274	Dow Chemical Co.	No	630,000	2.00			3.44
105	105	104½	104½	96	...	...	55	558	Dow Chemical Co., pfd.	100	3,000,000	7.00			
134	134	134	136	110	...	...	225	2,152	National Carbon, pfd.	100	5,600,000	7.00			
PHILADELPHIA STOCK EXCHANGE															
50	51	48	51†	25¼	40	19⅞	1,005	4,840	Pennsylvania Salt	50	150,000	3.00	Yr. Je. '30		7.97

Bonds

1933 October Last	1933 High	1933 Low	1932 High	1932 Low	Sales In October	Sales During 1933	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE											
...	90	88	94½	70½	80	62	15	736	Amer. Cyan. deb. 5s	1942	5	A. O.	4,554,000
86½	87½	84½	89	64	80	54½	310	3,077	Amer. I. G. Chem. conv. 5½s	1949	5½	M. N.	29,933,000
6½	6⅞	4⅞	14½	2⅛	18	1	45	1,117	Anglo-Chilean s. f. deb. 7s	1945	7	M. N.	14,600,000
57	61	57	74⅜	37	60	34½	28	359	By-Products Coke Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
102⅛	102½	102½	104½	100½	104⅞	100⅜	17	592	Corn Prod. Refin. 1st s. f. 5s	1934	5	M. N.	1,822,000
...	62	60	65	38½	54⅞	32	16	238	Int. Agric. Corp. 1st coll. tr. stamped to 1942	1942	5½		
7	7	5¾	14⅞	2½	15½	¼	159	27,853	Lautaro Nitrate conv. 6s	1954	6	J. J.	32,000,000
99¼	99½	94½	99⅛	87½	97¾	67	42	733	Montecatini Min. & Agric. deb 7s with warrants	1937	7	J. J.	8,188,000
47	47½	39¾	62	33¼	59	17	62	408	Ruhr chemical s. f. 6s	1948	6	A. O.	3,578,000
...	98	97	99½	87	90	66	69	1,014	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
66	66	60	76	50	66	39	8	235	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000
50½	70	61⅛	81	34½	75	30	79	1,582	Vanadium Corp. conv. 5s	1941	5	A. O.	5,000,000
NEW YORK CURB											
72½	72½	70	80½	49	76	55	224,000	3,041,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
72	72½	69½	80½	50	76	55	75,000	1,530,000	4½s., series "B"	1968	4½	M. N.	16,105,000
101½	102½	101½	103½	101	103½	99	13,000	21,100	Westvaco Chlorine Prod. 5½s	1937	5½	M. S.	1,992,000

b 11 mos. ending Aug. 30 w 13 mos.; Before inventory adjustment; *New Low; †New High

OTHER

Barrett Standard

CHEMICALS

PHENOL (Natural)
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Technical 39° M. Pt.
Crude 82-84% and 90-92%
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U.S.P., Meta Para, Ortho, Special Fractions
CRUDE CRESYLIC ACID
99% Straw Color and 95% Dark
XYLENOLS
TAR ACID OILS
NAPHTHALENE
Crude, Refined Chipped, Flake and Ball
RUBBER SOFTENERS
CUMAR*
Para Coumarone-indene Resin
BARRETAN*
PICKLING INHIBITORS
PYRIDINE
Refined, Denaturing and Commercial
PICOLINES
QUINOLINES
FLOTATION OILS and REAGENTS
HYDROCARBON OIL
SHINGLE STAIN OIL
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HOTEL CLEVELAND

The Trend of Prices

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, Sept.	196,082	236,487	84,150
–†Brokers Loans, Oct. 1	$896	$917	$379
*Building Contracts, Sept.	$122,615	$106,131	$127,526
–*Car Loadings, Oct. 21	650	664	641
†Commercial Paper, Sept. 30	$123	$107	$110
–†Elec. output., kwh., Oct. 21	1,618	1,618	1,528
Payrolls, Sept.	57.6	55.7	42.1
Factory emp. U. S. (cor. seas. var.) Sept.	74.3	73.3	60.3
Failures, Dun & Bradstreet, Sept.	1,116	1,472	2,182
*Merchandise Imports, Sept.	$147,000	$155,000	$98,411
*Merchandise Exports, Sept.	$160,000	$131,000	$132,037
Furnaces in Blast, % Oct. 1	31.2	34.4	16.5
*Steel Orders, Sept. 30	1,775	1,890	1,985

*000 omitted. †000,000. –Weeks, not months.

Slightly Disappointing

Business generally failed to make the usual seasonal advances in October. In the so-called heavy industries recessions were reported. Retail trade in most sections of the country was fairly good and it is hoped that Christmas buying will move stocks at such a pace as to prevent the old "bugaboo"—surplus stocks.

Activity in heavy manufacturing continued to be hampered by strikes, notably in the textile and shoe industries. Happily most of these have been at least temporarily ironed out. Steel operations are down to 26.1%. October's iron output was off 14%. Electrical output continues to run ahead of last year. Comparison for the 4 weeks of October with the corresponding weeks of last year is as follows:

	1933	*1932*	*Decrease*	*% Dec.*
Oct. 28*	1,621,702	1,533,028	88,674	5.8
Oct. 21	1,618,795	1,528,145	90,650	5.9
Oct. 14	1,618,948	1,507,503	111,445	7.4
Oct. 7	1,646,136	1,506,219	139,917	9.3

*In kilowatt hours, ooo omited.

Carloadings also continue to show improvement over the same period a year ago, but the total each week of October showed a drop from the previous 1. The decline is reported to be greater than the usual seasonal downward movement.

	1933	*1932*	*1931*	*1930*
Oct. 28	636,674	617,284	740,363	934,715
Oct. 21	650,482	641,985	769,673	959,492
Oct. 14	664,058	649,690	761,596	931,105
Oct. 7	654,428	625,089	763,848	954,782
Sept. 30	661,827	621,658	77,712	971,255

Building is picking up greatly aided by public works projects. For the 1st time this year activity is closely approaching the level of last year. During September contracts amounted to $122,615,700, a gain of almost 16% over the August, 1933, total of $106,131,100 and but slightly below the September, 1932, total of $127,526,700, according to F. W. Dodge Corp.

October automobile production was below the total of 201,890 units reached in September. Outlook is for further seasonal decline until the 1st of the year. Glass industry continued to hold the spurt made since April. Tanning operations declined in October. Shoe manufacturing was sharply curtailed because of strikes and a generally well-stocked state of trade.

Wholesale prices rallied sharply after President Roosevelt's radio address on Oct. 22 after declines on the 1st 3 weeks of the month. Fisher's Index showed a net gain of .4 points between Sept. 29 and Nov. 3, the respective figures being 71.4 and 71.8. *Journal of Commerce's* showed a loss, however. On Sept. 30 it stood at 71.9 and on Nov. 4, 70.9. *Annalist's* Weekly Index stood at 69.3 on Sept. 26 and on Oct. 31 at 68.4. Labor Dept's. Index also showed a net loss, 71.1 on Sept. 30 against 70.9 on Oct. 28. National Fertilizer Association combined index was 68.9 on Oct. 28 and 69.4 on Sept. 30. Concensus, of course, indicates net losses for the month.

Chemical tonnages did not show the usual seasonal upturn in October. The labor situation in the textile centers, Paterson-Passaic, Eastern Pennsylvania, parts of the South and New England and in several of the tanning sections was largely responsible. However, in a large number of items buyers were accumulating large inventories in anticipation of higher contract prices for 1934. This movement is expected to be accelerated in the last part of November and in December. Announcements of the chlorine, alkali and phosphate schedules have shown the wisdom of such action. Higher prices in many other important items appear to be certain.

Chemical prices in October failed to show much actual change as registered by the various indices. Outstanding, however, was the decline in fats and oils. The N. F. A. Indices compare as follows:

	Sept. 30	*Oct. 28*	*Year Ago*
Metals	79.1	79.2	68.0
Fats & Oils	48.1	46.7	41.4
Chem. and Drugs	87.0	87.0	87.4
Fertilizer Mat.	64.6	65.1	61.7
Mixed fert.	70.2	70.8	68.8

Other chemical indices show quite similar trend:

Index	*Oct. 3*	*Oct. 31*	*Nov. 1 1932*
Annalist, chemicals	97.0	96.9	95.3
Dept. of Labor (Chem. and Drugs)	72.1 (Sept. 30)	72.7 (Oct. 28)	

With the alkali and chlorine prices just released and a number of very important ones still to be, the major portion of the activity in the next 60 days will be devoted to contract signing. It is expected that with ash and prices out bichromate prices will follow shortly. The next few weeks will certainly not be dull ones.

Fertilizer Imports

September imports of fertilizer and fertilizer materials were 22% larger than the imports for September, 1932, but were 27% smaller than those for September, 1931. Largest increases were shown in receipts of guano, sodium nitrate, tankage, other nitrogenous materials, phosphate rock, kainite, and muriate of potash. Smaller imports were noted for sulfate, cyanamid, and other fertilizers. For 1st time in many months a cargo of phosphate rock was received from a foreign country. During September 5,625 tons, valued at $59,409 were received from French Oceania. A cargo of 1,671 tons of superphosphate, valued at $24,566, was received from Japan.

September exports of fertilizer and fertilizer materials were 91% larger than the exports for September, 1932, but were about 4% smaller than the exports for September, 1931. Shipments of land pebble rock, superphosphate, sulfate, nitrogenous organic waste materials, and potash fertilizers were much larger than a year ago. Almost 84,000 tons of land pebble rock were exported compared with about 25,000 tons for September, 1932. Smaller exports were noted for other nitrogenous chemicals (chiefly synthetic nitrate) and high grade hard rock. September marked 4th consecutive month in which both imports and exports were heavier than for the corresponding month a year ago.

September and October Tampa phosphate rock shipments were greater than for any other 2 months in the past 3 years. October shipments totaled 74,448 tons and September, 75,092 tons.

Tin Agreement

International Tin Committee signed Oct. 27 agreement to continue control of production of export tin to take effect Jan. 1. Total employed in calculating will be 165,650 long tons. Bolivia, Malay States, Netherlands, East Indies, Nigeria and Siam have accepted Tin Committee suggestion that their export quotas shall be fixed at not less than 40% of the standard tonnages allowed them. In addition to ordinary export quota as fixed from time to time it was agreed that for '34 there shall be a special quota of 4% of standard tonnages.

To determine amount each government may export in '34, there shall be deducted all excesses of exports, no matter what the cause, that may be outstanding Dec. 31, 1933, from date of inception of present curtailment plan. Committee estimates special quota will result in export of approximately 360 tons monthly.

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Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1932 Average $1.64 - Jan. 1932 $1.54 - Oct. 1933 $1.40

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.18½	.21	.18½	.21
Acetaldol, 50 gal dr.....lb.	.27	.31	.27	.31	.27	.31
Acetamide.....lb.	.95	1.35	.95	.35	.95	1.35
Acetanilid, tech, 150 lb bbl...lb.	....	.26	...	.26	.20	.26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30	.32
Acetone, tanks.....lb.	....	.09	.08	.10	...	.10
Acetone Oil, bbls NY.....gal..	1.15	1.25	1.15	1.25	1.15	1.25
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55	.68
Acetylene Tetrachloride (see tetrachlorethane).....						
Acids						
Acid Abietic.....	....	.06	.06	.12	.12	.12
Acetic, 28% 400 lb bbls c-1 wks .....100 lb.	....	2.91	2.65	2.91	2.40	2.75
Glacial, bbl c-1 wk....100 lb.	....	10.02	9.14	10.02	8.35	9.14
Adipic.....	.72	.72	.72	.72	.72	.72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85	.95
Technical, bbls.....lb.	.65	.70	.65	.70	.65	.70
Battery, cbys.....100 lb.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb bbls....lb.	.40	.45	.35	.45	.35	.45
Boric, powd, 250 lb. bbls. .....lb.	.0425	.05	.0425	.05	.0425	.07
Broenner's, bbls.. .....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 100% basis cbys....lb.	.80	.85	.80	.85	.80	.85
Camphoric.....lb.	....	5.25	...	5.25	.....	5.25
Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99½%, drs.....lb.	.12¼	.14¼	.11¼	.14¼	.11¼	.14¼
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.00	1.06
Citric, USP, crystals, 230 lb. bbls.....lb.	.29	.30	.29	.30	.29	.33½
Cleve's, 250 lb bbls.....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 95%, dark drs NY.gal.	.44	.45	.38	.45	.40	.47
97-99%, pale drs NY.....gal.	....	.47	.40	.47	.42	.50
Formic, tech 90%, 140 lb. cby.....lb.	.11	.13	.10½	.13	.10½	.12
Furoic, tech., 100 lb. drums.lb.	....	.35	...	.35	.....	.....
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60	.70
USP, bbls.....lb.	....	.74	...	.74	.....	.74
Gamma, 225 lb bbls wks.....fb	.77	.79	.75	.79	.75	.80
H, 225 lb bbls wks.....lb.	.65	.70	.60	.70	.60	.65
Hydriodic, USP, 10% soln cby lb.	.50	.51	.50	.51	.59	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, CP, see Acid Muriatic.....						
Hydrocyanic, cylinders wks .lb.	.80	.90	.80	.90	.80	.90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	....	.07	.06	.07	.....	.06
Hydrofluosilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11	.12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04	.04½
44%, light, 500 lb bbls.....lb.	.11½	.12	.11½	.12	.11½	.12
Laurent's, 250 lb bbls.... ...lb.	.36	.37	.36	.37	.36	.42
Linoleic.....lb.	.16	.16	.16	.16	.16	.16
Maleic, cry. kegs.....lb.	....	.35	...	...	...	...
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45	.60
Metanilic, 250 lb bbls.....lb	.60	.65	.60	.65	.60	.65
Mixed Sulfuric - Nitric..... tanks wks.....N unit	.06½	.07½	.06½	.07½	.07	.07½
tanks wks.....S unit	.008	.01	.008	.01	.008	.01
Monochloroacetic, tech bbl...lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.55	1.70
Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	....	1.35	...	1.35	.....	1.35
tanks, wks.....100 lb.	....	1.00	...	1.00	.....	1.00
20 degrees, cbys wks...100 lb.	....	1.45	...	1.45	.....	1.45
N & W.....250 lb bbls	.85	.95	.85	.95	.85	.95
Naphthenic, drums .....lb.	.10	.11½	.10	.11½	.....	.....
Naphthionic, tech.....250 lb.	.60	.65	.60	.65	.60	.65
Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	....	5.00	...	5.00	.....	5.00
40 deg, 135 lb cbys, c-1 wks.....100 lb.	....	6.00	...	6.00	.....	6.00
Oxalic, 300 lb bbls wks NY....lb.	.11	.11½	.11	.11½	.11	.11½
Phosphoric 50%, U. S. P.....lb.	....	.14	...	.14	.....	.14
Syrupy, USP, 70 lb drs....lb.	....	.14	...	.14	.....	.14
Picramic, 300 lb bbls.....lb.	.65	.70	.65	.70	.65	.70
Picric, kegs.....lb.	.30	.50	.30	.50	.30	.50
Pyrogallic, crystals..... .....lb.	1.40	1.45	1.40	1.45	1.45	1.60
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.33	.37
Sebacic, tech, drum.....lb.	.58	.58	.58	.58	.....	.....
Sulfanilic, 250 lb. bbls.....lb.	.15	.17	.15	.17	.14½	.16

†Anhydrous 5c higher. ‡From grain 5c higher. *Delivered metropolitan area, basic price 34c. §Higher price is refrigeration grade.

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95	1.60	1.95	1.60	1.95
tanks, wks, ton	....	15.00	....	15.00	.....	15.00
1500 lb dr wks.....100 lb.	1.50	1.65	1.50	1.65	1.50	1.65
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.27½	1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks.....ton	....	18.50	....	18.50	.....	18.50
40%, 1c-1 wks net.....ton	....	42.00	....	42.00	.....	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	....	.25	.20	.25	.20	.25½
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75	.85
Trichloroacetic bottles.....lb.	2.00	2.75	2.00	2.75	.....	2.75
Kegs.....lb.	....	1.75	....	1.75	.....	2.00
Tungstic, bbls.....lb.	1.40	1.70	1.40	1.70	1.40	1.70
Albumen, blood, 225 lb bbls...lb.	.35	.43	.35	.43	.35	.40
dark.....bbls., lb.	.10	.17	.10	.17	.10	.20
Egg, edible .....lb.	.83	.85	.74	.85	.75	.90
Technical, 200 lb cases...lb.	.62	.66	.62	.66	.62	.66
Vegetable, edible.....lb.	.65	.70	.60	.70	.60	.65
Technical.....lb.	.50	.55	.50	.55	.50	.55
Alcohol Butyl, Normal, 50 gal drs c-1 wks.....lb.	....	.10½	....	.10½	.123	.1595
Drums, 1-c-1 wks.....lb	....	.11	....	.11	.128	.1645
Tank cars wks.....lb.	....	.09½	....	.09½	.113	.143
Secondary tank .....lb.	....	.076	....	....	.....	....
drums carlots .....lb.	....	.086	....	....	.....	....
Amyl (from pentane) Tanks wks .....lb.	....	.143	.143	.176	.176	.203
Capryl, tech, drums.....lb.	....	.85	....	.85	.....	.85
Diacetone, tanks.....lb.	.15¼	.16¼	.15¼	.16¼	.....	.....
Ethyl, USP, 190 pf, 50 gal. bbls‡.....gal.	2.41½	2.58½	2.41½	2.65	2.55	2.65
No. 5. *188 pf, 50 gal. drs. drums extra†.....gal.	....	.351*	....	.385*	.27	.396
No. S. D. 1, tanks .....gal.	....	.304	....	.304	.....	.....
Furfuryl, tech., 500 lb. drs.lb	....	.40	.40	.45	.....	.....
Isobutyl, ref., gal. drs.....gal.	....	.75	....	.75	.....	.75
Isopropyl, ref, gal drs.....gal.	....	.50	.45	.50	.45	.65
Propyl Normal, 50 gal dr..gal.	....	.75	....	.75	.....	.75
Aldehyde Ammonia, 100 gal drlb.	.80	.82	.80	.82	.80	.82
Alpha-Naphthol, crude, 300 lb. bbls.....lb.	.65	.70	.65	.70	.57	.65
Alpha-Naphthylamine, 350 lb. bbls.....lb.	.32	.34	.32	.34	.32	.34
Alum Ammonia, lump, 400 lb bbls, 1-c-1 wks.....100 lb.	3.00	3.25	3.00	3.25	3.00	3.25
Chrome, 500 lb casks, wks .....100 lb.	....	6.50	4.50	6.50	4.50	5.25
Potash, lump, 400 lb casks wks.....100 lb.	3.00	3.50	3.00	3.50	3.00	3.50
Soda, ground, 400 lb bbls wks.....100 lb.	3.50	3.75	3.50	3.75	3.50	3.75
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.00	24.30	22.90	24.30
Chloride Anhydrous .....lb.	.04	.08	.04	.09	.05	.09
Hydrate, 96%, light, 90 lb. bbls.....lb.	.15	.16½	.15	.16½	.15	.17
Palmitate, bbls,.....lb.	.19	.20	....	....	.....	.....
Resinate, pp., bbls.....lb.	.12½	.14	....	....	.....	.....
Stearate, 100 lb bbls.....lb.	.17	.18	.12½	.18	.15	.21
Sulfate, Iron, free, bags c-1 wks.....100 lb.	1.90	1.95	1.90	1.95	1.90	1.95
Coml, bags c-1 wks .100 lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminoazobenzene, 110 lb kegs lb.	....	1.15	....	1.15	.....	1.15
Ammonia						
Ammonia anhydrous Com. tanks	.04½	.05⅛	.04½	.05½	.05	.05½
Ammonia, anhyd. 100 lb cyl...lb.	.15½	.15½	.15½	.15½	.15½	.15½
Water, 26°, 800 lb dr del...lb.	.02½	.03	.02½	.03	.02½	.03
Ammonia, aqua 26° tanks.... NH cont.....	....	.05	.....	.05	.....	.....
Ammonium Acetate .....lb.	.26	.33	.26	.33	.26	.39
Bicarbonate, bbls., f.o.b. plant .....100 lb.	....	5.15	....	5.15	.....	5.15
Bifluoride, 300 lb bbls.....lb.	.15¼	.17	.15¼	.17	.14½	.22
Carbonate, tech, 500 lb cs..lb.	.08	.12	.08	.12	.08	.12
Chloride, white, 100 lb. bbls wks .....100 lb.	5.00	5.25	4.45	5.25	4.45	5.15
Gray, 250 lb bbls wks...lb.	5.25	5.75	5.25	5.75	5.25	5.75
Lump, 500 lb cks spot...lb.	.10	.11	.10	.11	.10½	.11½
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15	.16
Linoleate.....lb.	....	.11	....	.11	.11	.15
Nitrate, tech, casks.....lb.	.03¾	.05	.03¾	.10	.06	.10
Oleate, drs.....lb.	....	.10	....	.10	.....	.10
Persulfate, 112 lb kegs.....lb.	.20	.22½	.20	.22½	.20	.27½
Phosphate, tech, powd, 325 lb. bbls.....lb.	.08½	.11½	.08½	.11½	.08½	.12
Sulfate, bulk c-1.....100 lb.	....	1.20	1.00	1.20	.90	1.40
Sulfocyanide, kegs.....lb.	.36	.48	.36	.48	.36	.48
Amyl Acetate, (from pentane) Tanks del.....lb	....	.13½	...	.13½	.157	.17½

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	Current Market	1933 Low	1933 High	1932 Low	1932 High
Tech., drs del. . . . . lb.	.142	.149	.138	.149	.17½ .18
Amyl Alcohol, see Fusel Oil.					
Aniline Oil, 960 lb drs & tks. . lb.	.13½	.14¼	.14½	.16	.14½ .16
Annatto, fine. . . . . lb.	.34	.37	.34	.37	.34 .37
Anthracene, 80% . . . . . lb.	....	.75	....	....	....
40% . . . . . lb.	....	.18	....	....	....
Anthraquinone, sublimed, 125 lb. bbls. . . . . lb.	....	.45	...	.45	.45 .55
Antimony, metal slabs, ton lots . . . . . lb.	....	.06¾	.05½	.07½	.05 .06½
Needle, powd, bbls. . . . . lb.	.08	.09	.07	.09	.08½ .09
Chloride, soln (butter of) cbys. . . . . lb.	.13	.17	.13	.17	.13 .17
Oxide, 500 lb bbls. . . . . lb.	.08½	.11	.07½	.11	.07½ .08½
Salt, 63% to 65%, tins. . . . lb.	.22	.24	.20	.24	.20 .24
Sulfuret, golden, bbls . . . . . lb.	.16	.20	.16	.20	.16 .20
Vermillion, bbls. . . . . lb.	.38	.42	.38	.42	.38 .42
Archil, conc, 600 lb bbls. . . . . lb.	.20	.21	.20	.21	.17 .21
Double, 600 lb bbls. . . . . lb.	.16	.17	.16	.17	.16 .17
Triple, 600 lb bbls. . . . . lb.	.16	.17	.16	.17	.16 .17
Argols, 80%, casks. . . . . lb.	.14	.15	.12	.15	.12½ .13
Crude, 30%, casks. . . . . lb.	.07	.08	.06½	.09	.07 .07½
Aroclors, wks. . . . . lb.	.18	.30	.18	.30	.18 .40
Arrowroot, bbl. . . . . lb.	.08½	.08½	....	....	....
Arsenic, Red, 224 lb kegs, cs. . lb.	.14	.14¼	.09½	.14½	.09½ .10
White, 112 lb kegs. . . . . lb.	.04	.05	.04	.05	.04 .05
Asbestine, c-1 wks. . . . . ton	13.00	15.00	13.00	15.00	..... 15.00
Barium					
Barium Carbonate, precip, 200 lb. bags wks. . . . . ton	56.50	61.00	56.50	61.00	47.00 57.00
Nat. (witherite) 90% gr. carlots wks bags. . . . . ton	.....	45.00	....	....	....
Chlorate, 112 lb kegs NY. . lb.	.15	.16	.13½	.16	.13½ .15
Chloride, 600 lb bbl wks. . . ton	72.00	74.00	61.50	74.00	63.00 69.00
Dioxide, 88%, 690 lb drs. . . lb.	.11	.13	.11	.13	.11 .13
Hydrate, 500 lb bbls. . . . . lb.	.04¾	.05	.04½	.05	.04½ .05½
Nitrate, 700 lb casks. . . . . lb.	.....	.07¼	...	.07¼	.07 .08
Barytes, Floated, 350 lb bbls wks. . . . . ton	22.50	30.50	22.20	30.50	22.00 24.00
Bauxite, bulk, mines. . . . . ton	5.00	6.00	5.00	6.00	5.00 6.00
Bayberry, bags. . . . . lb.	.15	.16	.14½	.17	....
Beeswax, Yellow, crude bags. . lb.	.18½	.19	.13	.20	.14½ .24
Refined, cases. . . . . lb.	.22	.24	.18	.26	.20 .28
White, cases. . . . . lb.	.32	.35	.30	.35	.30 .36
Benzaldehyde, technical, 945 lb. drums wks. . . . . lb.	.60	.65	.60	.65	.60 .65
Benzene, 90%, Industrial, 8000 gal tanks wks. . . . . gal.	.....	.22	.20	.22	..... .20
Ind. Pure, tanks works. . . . gal.	.....	.22	.20	.22	..... .20
Benzidine Base, dry, 250 lb. bbls. . . . . lb.	.67	.69	.65	.67	.65 .67
Benzoyl, Chloride, 500 lb drs. lb.	.40	.45	.40	.45	.40 .47
Benzyl Chloride, tech drs. . . . lb.	.....	30	...	.30	..... .30
Beta-Naphthol, 250 lb bbl wk. lb.	.....	.22	...	.22	..... .22
Naphthylamine, sublimed, 200 lb bbls. . . . . lb.	1.25	1.35	1.25	1.35	1.25 1.35
Tech, 200 lb bbls . . . . . lb.	.53	.58	.53	.58	.53 .58
Bismuth, metal	....	1.20	.85	1.20	....
Bismuth Subnitrate	....	1.40	.95	1.40	....
Blackstrap, cane, (see Molasses, Blackstrap)					
Blanc Fixe, 400 lb bbls wks. . ton	42.50‡	70.00	42.50	75.00	....
Bleaching Powder, 800 lb drs c-1 wks contract. . . . 100 lb.	1.75	2.00	1.75	2.00	1.75 2.00
Blood, Dried, fob, NY. . . . . Unit	.....	2.40	1.55	2.70	1.20 1.90
Chicago, high grade. . . . . Unit	.....	2.25	....	....	....
S. American shipt. . . . . Unit	.....	2.50	1.90	3.00	2.00 2.25
Blues, Bronze Chinese Milori Prussian Soluble. . . . . lb.	.....	.35	...	.35	..... .35
Bone, raw, Chicago. . . . . ton	26.00	28.00	19.00	28.00	20.00 22.00
Bone Ash, 100 lb kegs. . . . . lb.	.06	.07	.06	.07	.06 .07
Black, 200 lb bbls. . . . . lb.	.05½	.08½	.05½	.08½	.05½ .08½
Meal, 3% & 50%, Imp. . . . ton	.....	25.00	18.00	26.00	20.00 23.00
Borax, bags . . . . . lb.	.018	.02	.018	.02	.018 .03¼
Bordeaux, Mixture, 16% pwd. lb.	.08½	.10½	.11½	.10½	.11½ .13
Paste, bbls. . . . . lb.	.08½	.13	.10½	.13	.11½ .13
Brazilwood, sticks, shpmt. . . . . lb.	26.00	28.00	26.00	28.00	26.00 28.00
Bromine, cases. . . . . lb.	.36	.43	.36	.43	.36 .43
Bronze, Aluminum, powd blk. . lb.	.50	.75	.50	.75	.60 1.20
Gold bulk. . . . . lb.	.40	.55	.40	.55	.55 1.25
Butanes, com 16.32° group 3 tanks. . . . . lb.	.02¾	.04	.02¾	.04	....
Butyl, Acetate, normal drs. . . lb.	.....	.11	.11	.139	.134 .166
Tank, wks. . . . . lb.	.....	.10	.10	.124	.124 .143
Secondary tanks, wks. . . . . lb.	.....	.08	....	....	....
Aldehyde, 50 gal drs wks. . . lb.	.35	.36	.31½	.36	.31½ .36
Carbitol see Diethylene Glycol Mono (Butyl Ether)	.....	....	....	....	....
Cellosolve (see Ethylene glycol mono butyl ether)					
Furoate, tech., 50 gal. dr. . lb.	.....	.60	.50	.60	..... .50
Lactate, drums . . . . . lb.	....	.29	....	....	....
Propionate, drs. . . . . lb.	.20	.22	.20	.22	.20 .25
Stearate, 50 gal drs. . . . . lb.	.25	.25½	.25	.25½	.25 .25½
Tartrate, drs . . . . . lb.	.55	.60	.55	.60	.55 .60
Cadmium, Sulfide, boxes. . . . . lb.	.65	.75	.65	.75	.65 .90
Calcium, Acetate, 150 lb bags c-1. . . . . 100 lb.	.....	3.00	2.50	3.00	2.00 2.50
Arsenate, 100 lb bbls c-1 wks. . . . . lb.	.....	.07	.05½	.07	.05½ .06
Carbide, drs. . . . . lb.	.05	.06	.05	.06	.05 .06
Carbonate, tech, 100 lb bags c-1. . . . . lb.	1.00	1.00	1.00	1.00	1.00 1.00
Chloride, Flake, 375 lb drs c-1 wks. . . . . ton	.....	19.50	19 50	21.00	..... 21.00
Solid, 650 lb drs c-1 fob wks . . . . . ton	.....	17.50	17.50	18.00	..... 18.00

†F. O. B. destination, 1931 prices are works prices.
‡Lowest price is for pulp; highest for high-grade precipitate.

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Calcium Furoate, tech, 100 lb. drums lb		.30		.30		.30
Nitrate, 100 lb bags ton		25.50	24.00	26.00	34.00	35.00
Palmitate, bbls lb.	.19	.20	.16	.19		
Peroxide, 100 lb drs lb		1.25		1.25		1.25
Phosphate, tech, 450 lb bbls lb.	.07½	.08	.07½	.08	.07½	.08¾
Resinate, precip., bbls lb.	.13	.14				
Stearate, 100 lb. bbls lb.	.17	.18	.12½	.18	.16	.18
Camphor, slabs lb.	.48½	.49	.35½	.52		
Powder lb.	.49	.50	.38	.52		
Camwood, Bark, ground bbls lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags lb.	.09½	.10	.09	.11	.10	.14
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)						
Carbon, Decolorizing, drums c-1 lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases 1c-1 NY lb.	.06	.12	.06	.12	.06	.12
Bisulfide, 500 lb drs 1c-1 NY lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb cyl. lb.		.06		.06		.06
Tetrachloride, 1400 lb drs delivered lb.	.05½	.06	.05½	.07	.06½	.07
Carnauba Wax, Flor, bags lb.	.30	.32	.23	.31	.23	.28
No. 1 Yellow, bags lb.	.28	.29	.20	.30	.21	.24
No. 2 N Country, bags lb.	.16½	.17½	.14	.18	.13	.16
No. 2 Regular, bags lb.	.28	.29	.20	.29	.20	.24
No. 3 N. C. lb.	.13¾	.14	.11½	.16	.11	.13
No. 3 Chalky lb.	.13¾	.14	.12	.14	.11	.13
Casein, Standard, Domestic, ground lb	.12½	.13	.06½	.15	.04¾	.07½
80-100 mesh carlots, bags lb.	.13½	.14				
Cellosolve (see Ethylene glycol mono ethyl ether)						
Acetate (see Ethylene glycol mono ethyl ether acetate)						
Celluloid, Scraps, Ivory cs lb.	.13	.14	.13	.15	.13	.15
Shell, cases lb.	.18	.20	.18	.20	.18	.20
Transparent, cases lb.		.16		.16		.15
Cellulose, Acetate, 50 lb kegs lb.	.80	.90	.80	.90	.80	.90
Chalk, dropped, 175 lb bbls. lb.	.03	.03¾	.03	.03½	.03	.03¾
Precip, heavy, 560 lb cks. lb.	.02	.03½	.02	.03½	.02	.03½
Light, 250 lb casks lb.	.02½	.03½	.02½	.03½	.02½	.03½
Charcoal, Hardwood, lump, bulk wks bu.	.18	.19	.18	.19	.18	.19
Willow, powd, 100 lb bbl. wks lb.	.06	.06½	.06	.06½	.06	.06½
Wood, powd, 100 lb bbls. lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks lb.	.01¼	.02	.01¼	.02	.01¾	.02
25% tks wks lb.		.01½	.012	.01½	.07¼	.02½
Powd, 60%, 100 lb bgs wks lb.		.04¾		.04¾		.04¾
Powd, decolorized bgs wks. lb.	.04¾	.05	.04¾	.05	.04¾	.06
China Clay, lump, blk mines ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract lb.		.05½†		.05½		.05½
Liq tank or multi-car lot cyls wks contract 100 lb.		1.75		1.75	1.55	1.75
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks lb.	.06	.07½	.06	.07½	.06	.10½
Chloroform, tech, 1000 lb drs. lb.		.20	.15	.20	.15	.16
USP, tins lb.		.30				
Chloropicrin, comml cyls lb.	.90	1.25	.90	1.35	1.00	1.35
Chrome, Green, CP lb.	.23	.29	.23	.29	.23	.29
Commercial lb.	.06½	.10	.06½	.10	.06½	.11
Yellow lb.	.14	.15	.14	.15	.14	.18
Chromium, Acetate, 8% Chrome bbls lb.	.05	.05½	.04½	.05½	.04½	.05½
20° soln, 400 lb bbls lb.		.05½		.05½		.05½
Fluoride, powd, 400 lb bbl. lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls lb.	.28	.33	.28	.33	.28	.35½
Coal tar, bbls bbl.	8.50	9.00	.50	9.00	10.00	10.50
Cobalt Acetate, bbls lb.	.75	.80				
Carbonate tech., bbls lb.	1.34	1.40				
Hydrate, bbls lb.	1.66	1.76				
Linoleate, paste, bbls lb.	.39	.40				
Resinate, fused, bbls lb.		.12½				
Precipitated, bbls lb.	.41	.42	.41	.42		
Cobalt Oxide, black, bags lb.	1.15	1.25	1.15	1.25	1.15	1.45
Cochineal, gray or black bag. lb.	.36	.42	.36	.42	.38	.57
Teneriffe silver, bags lb.	.37	.43	.37	.43	.39	.57
Copper, metal, electrol 100 lb.		8.50	5.00	9.00	5.05	7.25
Carbonate, 400 lb bbls lb.		.08	.07	.08	.07	.08
52-54% bbls lb.		.15½	.15¾	.17¼		
Chloride, 250 lb bbls lb.	.17	.18	.17	.18	.17	.25
Cyanide, 100 lb drs lb.	.39	.40	.39	.40	.39	.40
Oleate, precip., bbls lb.		.20				
Oxide, red, 100 lb bbls lb.	.14¾	.15	.14¼	.15	.15	.16
Resinate, precip., bbls lb.	.18	.19				
Stearate, precip., bbls lb.	.35	.40				
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-1 wks 100 lb.		3.75	3.00	3.75	2.75	3.10
Copperas, crys and sugar bulk c-1 wks bags ton	14.00	14.50	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls. 100 lb.		2.73	2.61	2.88		
43 deg., bbls 100 lb.		2.78	2.66	2.93		
Cotton, Soluble, wet, 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cottonseed, S. E. bulk c-1 ton		*(See Oils and Fats News Section)*				
7% Amm., bags mills ton	13.25	38.00	13.25	38.00	13.25	38.00
Cream Tartar, USP, 300 lb. bbls lb.	.17½	.17¾	.14½	.17¾	.15½	.20½
Creosote, USP, 42 lb cbys lb.	.45	.47	.40	.47	.40	.42
Oil, Grade 1 tanks gal.	.11	.12	.11	.12	11	12½
Grade 2 gal.	.10	.12	.10	.12	.10	.11½
Grade 3 gal.	.09	.12	.09	.12	.09	.11½
Cresol, USP, drums lb.	.10½	.11	.10½	.11	.10½	.11

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CHEMICALS CORPORATION

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Red Cross
and
Unemployment Relief

MORE than two-thirds of the nation-wide system of Red Cross chapters and branches are today participating in unemployment relief. These include such activities as garment production and distribution, provision of hot school lunches and milk for needy children, family welfare work, aiding veterans of the World War and transients, promoting food conservation by canning the surplus products. The Red Cross has accommodated itself to the unusual needs of the times by extending its sphere of helpfulness and multiplying its deeds of mercy. The memberships of the American people, subscribed at the annual Roll Call, from Armistice Day to Thanksgiving, make possible this augmented service.

Prices

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.32	.36
Cudbear, English.....lb.	.19	.25	.16	.25	.16	.17
Cutch, Rangoon, 100 lb bales..lb.	.....	.02¾	.02½	.03	.08¾	.12
Borneo, Solid, 100 lb bale...lb.	.....	.04½	.02½	.04½	.03	.07
Cyanamide, bags c-l frt allowed Ammonia unit.....		1.07½	.97½	1.07½		.97½
Dextrin, corn, 140 lb bags.100 lb.	3.47	3.67	2.89	3.84	2.99	3.67
British Gum, bags .....100 lb.	3.72	3.92	3.89	3.92	.....	.....
White, 140 lb bags .....100 lb	3.38	3.52	2.94	3.79	2.94	3.37
Potato Yellow, 220 lb bgs..lb.	.07¾	.08¾	.07¾	.09	.08	.09
White, 220 lb bags lc-l....lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 lb bags lc-l...lb.	.06¾	.07¾	.06¾	.08	.07	.08¾
Diamylether, wks., drums....lb.	.....	.60	....	....	.....	.....
Diamylphthalate, drs wks...gal.	.....	.20½	....	....	.....	.....
Dianisidine, barrels.....lb.	2.35	2.70	2.35	2.70	2.35	2.70
Dibutylphthalate, wks.....lb.	.20½	.21	.20½	.22	.218	.23½
Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.29½	.21	.29½	.31½
Dichlorethylene, drums.....gal.	.29	....	....	....	.....	.....
Dichloroethylether, 50 gal drs lb.	.....	.16	....	.16	.....	.16
Dichloromethane, drs wks....lb.	....	.15	....	....	.....	.....
Diethylamine, 400 lb drs.....lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylcarbonate, com. drs..gal.	.....	.31¾	....	....	.....	.....
Diethylaniline, 350 lb drs....lb.	.52	.55	.52	.55	.55	.60
Diethyleneglycol, drs.....lb.	.14	.16	.14	.16	.14	.16
Mono ethyl ether, drs...lb.	.15	.16	.15	.16	.15	.16
Mono butyl ether, drs...lb.	.....	.26	....	.26	.24	.30
Diethylene oxide, 50 gal drs..lb.	.26	.27	.26	.27	.....	.....
Diethylorthotoluidin, drs.....lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums.....lb.	.....	.20	.20	.26	.23	.26
Diethylsulfate, technical, 50 gal drums.....lb.	...	...	....	....	.30	.35
Digtycol Oleate, bbls.....lb.	.....	.16	....	....	.....	.....
Dimethylamine, 400 lb drs, pure 25 & 40% sol. 100% basis.lb.	.....	1.20	....	....	.....	....
Dimethylaniline, 340 lb drs...lb.	.26	.28	.25	.28	.25	.27
Dimethyl phthalate drs.....lb.	.....	.24½	....	....	.....	.....
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls...lb.	.....	.18	....	.18	.15	.16
Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.13	.15	.13	.15
Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls....lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls....lb.	.15	.16	.15	.17	.16	.17
Dioxan (See Diethylene Oxide).....	.....	....	....	....	.....	.....
Diphenyl.....lb.	.15	.25	.15	.40	.20	.40
Diphenylamine.....lb.	.31	.34	.31	.34	.34	.37
Diphenylguanidine, 100 lb bbl lb.	.33	.35	.30	.35	.30	.35
Dip Oil, 25%, drums.....lb.	.23	.25	.23	.25	.26	.30
Divi Divi pods, bgs shipmt..ton	.....	28.00	26.00	32.00	26.00	30.00
Extract.....lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb cases .....lb.	.42	.43	.40	.43	.40	.52
Epsom Salt, tech, 300 lb bbls c-l NY... .....100 lb.	.....	2.20	....	2.20	1.70	1.90
Ether, USP anaesthesia 55 lb. drs. .....lb.	.....	.24	.22	.24	.22	.23
(Cone).....lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal. drums ...lb.	.07‡x	.08	.07	.08	.....	.....
Synthetic, wks, drums.....lb.	.08	.09	....	....	.....	.....
Ethyl Acetate, 85% Ester tanks.....lb.	.07½	.08	.07½	.09	.08½	.09
drums.....lb.	.08½	.09	.08½	.10	.09½	.10
Anhydrous, tanks.....lb.	.09	.10	.09	.10	.....	.10
drums.....lb.	.10	.10½	.10	.10½	.....	.10½
Acetoacetate, 50 gal drs....lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums.....lb.	.50	.55	.50	.55	.50	.55
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.85	1.90
Chloride, 200 lb drums.....lb.	.22	.24	.22	.24	.....	.22
Chlorocarbonate, cbys.....lb.	.....	.30	....	.30	.....	.30
Ether, Absolute, 50 gal drs..lb.	.50	.52	.50	.52	.50	.52
Furoate, 1 lb tins.....lb.	.....	1.00	1.00	5.00	....	5.00
Lactate, drums works ...lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs..lb.	.....	.12½	....	.12½	.....	.30
Oxalate, drums works.....lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks lb.	.30	.30½	.30	.30½	.....	.30½
Ethylene Dibromide, 60 lb dr..lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys. chloro, cont.....lb.	.75	.85	.75	.85	.7	.85
Dichloride, 50 gal drums....lb.	.05	.06	.05	.09	.0595	.07
Glycol, 50 gal drs wks.....lb.	.26	.28	.25	.28	.25	.28
Mono Butyl Ether drs wks.....	.....	.20	....	.20	.20	.24
Mono Ethyl Ether drs wks	.15	.17	.15	.17	.15	.20
Mono Ethyl Ether Acetate dr. wks.....	.16½	.18	.16½	.18	.16½	.23
Mono Methyl Ether, drs..lb.	.21	.23	.21	.23	.21	.23
Stearate.....	.18	.18	.18	.18	.18	.18
Oxide, cyl.....lb.	.....	.75	....	.75	.75	2.00
Ethylidenaniline.....lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk pottery .....ton	15.50	16.50	14.00	16.50	15.00	20.00
Powdered, bulk works....ton	13.50	14.50	13.50	14.50	15.00	21.00
Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.05	.07½	.04½	.07½	.04½	.07½
Fish Scrap, dried, wks.....unit	.....	2.60*	1.85	2.75*	1.60	3.00
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	2.50†	1.85	2.50†	1.40	2.40
Fluorspar, 98% bags.....28.00		35.50	28.00	35.50	28.00	46.00

*& 10; †& 50 xTanks 2c lower.

Formaldehyde

Formaldehyde, aniline, 100 lb..... drums.....lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks.....lb.	.06	.07	.06	.07	.06	.07½
Fossil Flour.....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines...ton	15.00	20.00	15.00	20.00	15.00	20.00
Imp. powd c-l bags.....ton	24.00	30.00	24.00	30.00	24.00	30.00
Furfural (tech.) drums wks,..lb.	.10§	.15	.10	.15	.....	.10
Furfuramide (tech) 100 lb dr..lb.	.....	.30	....	.30	.....	.30
Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	....	5.00	.....	5.00
Fusel Oil, 10% impurities....lb.	.16	.18	.14½	.18	.....	.....

‡Higher price, refined. §Tanks, 1c lower

Current

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Fustic, chips.....lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes.....lb.	.20	.23	.18	.23	.18	.20
Liquid 50°, 600 lb bbls.....lb.	.08	.10	.07	.10	.07	.08
Solid, 50 lb boxes.....lb.	.16	.18	.14	.18	.14	.16
Sticks.....ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls.....lb.	.42	.43	.42	.43	.42	.50
Gall Extract.....lb.	.18	.20	.18	.20	.18	.20
Gambier, common 200 lb cs..lb.	.04	.05½	.03	.07	.06½	.07
Singapore cubes, 150 lb bg..lb.	.06	.07	.05½	.08	.07¼	.09
Gelatin, tech, 100 lb cases.....lb.	.45	.50	.45	.50	.45	.50
Glauber's Salt, tech, c-1 wks. .....100 lb.	1.00	1.70	1.00	1.70	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb bags .....100 lb.....		2.33	....	2.33	2.36	2.75
Glue, medium white, bbls....lb.	.19	.23	.12	.23	.15½	.20
Pure white, bbls.....lb.	.23	.28	.18	.28	.18	.27
Glycerin, CP, 550 lb drs.....lb.....		.10¼	....	.10¼	.09¾	.11½
Dynamite, 100 lb drs.....lb.....		.09½	.07½	.09½	.07½	.09¾
Saponification, tanks.....lb.	.07½	.08	.05	.08	.04½	.06½
Soap Lye, tanks.....lb.	.05¼	.06	.04	.06	.03¾	.05
Glyceryl Stearate, bbls.....lb.....		.18	.17	.18	.....	.17
Graphite,						
Crystalline, 500 lb. bbls...lb.	.0	.0	.04	.05	.04	.05
Flake, 500 lb bbls.....lb.	.08	.16	.08	.16	.08	.16
Amorphous bbls.....lb.	.03	.0	.03	.04	.03	.04
Gums						
Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03¾	.04½	.03¾	.04½	.03¾	.04½
Powd, 150 lb bags.....lb.	.06	.06½	.06	.06½	.06	.06½
Yellow, 150-200 lb bags....lb.	.18	.20	.18	.20	.18	.20
Aloes, Barbadoes .....lb.	.85	.90	.85	.90	.....	.....
Animi (Zanzibar) bean & pea 250 lb cases.....lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases.....lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts.....lb.	.07½	.08	.05¾	.08	.....	.....
Asphaltum, Barbadoes (Manjak) 200 lb bags.....lb.	.03	.06	.03	.05	.04	.06
Egyptian, 200 lb cases.....lb.	.13	.15	.13	.15	.13	.15
Ester, light.....lb.....		.06	....	....	.....	.....
Dark.....lb.....		.05¾	....	....	.....	.....
Gamboge, pipe, cases.....lb.	.60	.65	.42	.65	.....	.....
Powdered, bbls.....lb.	.65	.70	.50	.70	.....	.....
Gilsonite Selects, 200 lb bags .....ton	30.50	32.90	30.50	32.90	30.50	32.90
Damar Batavia standard 136, lb. cases.....lb.	.12½	.13	.08½	.15½	.08½	.09
Batavia Dust, 160 lb bags.....lb.	.06	.07	.04	.07½	.04	.05½
E Seeds, 136 lb cases.....lb.	.08	.09	.05½	.09½	.05½	.06½
F Splinters, 136 lb cases and bags.....lb.	.05½	.06	.05½	.06	.05½	.06
Singapore, No. 1, 224 lb cases .lb.	.15	.15½	.09½	.17½	.10½	11
No. 2, 224 lb cases.....lb.	.09½	.10½	.07	.11½	.06	.07½
No. 3, 180 lb bags.....lb.	.07	.07½	.04½	.07½	.04½	.05
Benzoin Sumatra, U. S. P. 120 lb. cases.....lb.	.20	.20½	.17	.23	.18	.22
Copal Congo, 112 lb bags, clean opaque.....lb.	.25	.25½	.16½	.25½	.16½	.17
Dark, amber.....lb.	.09¼	.10	.06	.09¼	.06	.07
Light, amber.....lb.	.12	.17	.08	.17	.08	.09
Water, white.....lb.	.45	.48	.37	.48	.37	.45
Kino, tins.....lb.	.75	.80	....	....	.....	.....
Mastic.....lb.	.37½	.40	.26½	.40	.26½	.40
Manila 180-190 lb baskets						
Loba A.....lb.	.13	.13½	.09	.13½	.09	.11
Loba B.....lb.	.12½	.13	.08	.13	.08	.08½
Loba C.....lb.	.11½	.12	.07	.12	.07	.08
M A Sorts.....lb.	.06½	.07	.05	.07	.04¼	.05
D B B Chips.....lb.	.09	.09½	.05¾	.09½	.05	.06½
East Indies chips, 180 lb bags lb.	.04¼	.05	.04	.07	.04½	.05½
Pale bold, 224 lb cs.....lb.	.16	.17	.05½	.17	.06	.08
Pale nubs, 180 lb bags...lb.	.11	.13	.05	.13	.03½	.05
Pontianak, 224 lb cases.....						
Bold gen No. 1.....lb.	.17	.18	.14	.18	.14	.16
Gen. chips spot.....lb.	.06½	.07	.05	.07	.05	.08
Elemi, No. 1, 80-85 lb cs....lb.	.11½	.13½	.09	.12½	.09	.09½
No. 2, 80-85 lb cases.....lb.	.11½	.12	.08½	.12	.08½	.09
No. 3, 80-85 lb cases.....lb.	.08	.08½	.08	.08½	.08	.08½
Ghatti, sol. bags.....lb.	.09	.09½	.06	.09½	.....	.....
Karaya, pow. bbls xxx.....lb.	.23	.25	....	....	.....	.....
xx.....lb.	.15	.16	....	....	.....	.....
No. 1.....lb.	.10	.11	....	....	.....	.....
No. 2.....lb.	.08	.09	....	....	.....	.....
Kauri, 224-226 lb cases No. 1.lb.	.20	.25	.20	.25	.20	.42
No. 2 fair pale.....lb.	.12½	.16	.12½	.16	.12½	.30
Brown Chips, 224-226 lb. cases.....lb.	.06½	.08½	.06½	.12	.10	.12
Bush Chips, 224-226 lb. cases.....lb.	.22	.24	.22	.24	.22	.24
Pale Chips, 224-226 lb cases .....lb.	.11	.14	.11	.14	.11	.14
Sandarac, prime quality, 200 lb. bags & 300 lb. casks.....lb.....		.48	.21	.48	.23	.25½
Senegal, picked bags.....lb.	.15	.16	....	....	.....	.....
Sorts.....lb.....		.08	....	....	.....	.....
Thus, bbls.....280 lbs.....		8.25	....	....	.....	.....
Strained.....280 lbs.....		8.25	....	....	.....	.....
Tragacanth, No. 1 bags.....lb.....		1.00	.65	1.00	.....	.....
Yacca, bags.....lb.....		.04	....	....	.....	.....
Helium, 1 lit. bot.....lit.....		25.00	....	25.00	.....	25.00
Hematine crystals, 400 lb bbls lb.	.16	.18	.10	.18	.10	.18
Paste, 500 bbls.....lb.....		.11	....	.11	.....	.11
Hemlock 25%, 600 lb bbls wks lb.	.03½	.04½	.03½	.04½	.03	.04½
Bark.....ton.....		16.00	....	16.00	.....	16.00
Hexalene, 50 gal drs wks.....lb.....		.30	....	.30	.30	.40
Hexane, normal 60-70° C. Group 3, tanks.....gal.....		.11	....	....	.....	.....
Hexamethylenetetramine, drs lb.	.37	.39	....	....	.....	.....
Hoof Meal, f.o.b. Chicago...unit	1.45	1.60	.75	1.75	.75	1.35
South Amer. to arrive....unit	1.45	1.50	1.40	1.50	1.25	1.65

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Hydrogen Peroxide
Myrobalans

Prices

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride	lb.		3.15	....	3.15	.....	3.15
Hypernic, 51°, 600 lb bbls	lb.	.17	.20	.11	.20	.11	.12
Indigo Madras, bbls	lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums	lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid	lb.		.12	....	.12	.....	.12
Iodine, crude	per kilo.		15s 1d	....	....	.....	.....
Resublimed, kegs	lb.		2.10	2.10	3.40	.....	.....
Irish Moss, ord. bales	lb.	.06	.07	....	....	.....	.....
Bleached, prime, bales	lb.	.08	.12	....	....	.....	.....
Iron Chloride see Ferric or Ferrous							
Nitrate, kegs	lb.	.09	.10	.09	.10	.09	10
Coml, bbls	100 lb.	2.75	3.25	2.50	3.25	2.50	3.25
Oxide, English	lb.	.04½	.07	.04	.07	.04	.10
Japan Wax, 224 lb cases	lb.	.07	.07¼	.05½	.08	.06	.09
Kieselguhr, 95 lb bgs NY							
Brown	ton	60.00	70.00	60.00	70.00	60.00	70 00
Lead Acetate, bbls wks	100 lb.		9.50	8.50	9.50	9.00	10.00
White crystals, 500 lb bbls wks	100 lb.		10.50	9.50	10.50	10.00	11.00
Arsenate, drs lc-l wks	lb.	.10	.10½	.09	.10½	09½	.13
Dithiofuroate, 100 lb dr	lb.		1.00	....	1.00	....	1.00
Linoleate, solid bbls	lb.	.26	.26½	....	....	....	....
Metal, c-l NY	100 lb.		4.30	3.00	4.50	2.70	3.75
Nitrate, 500 lb bbls wks	lb.	.10	.14	.10	.14	.10½	.14
Oleate, bbls	lb.	.15	.16	.15	.16	.15	.18
Lead Oxide Litharge, 500 lb. bbls	lb.		.06½	.05½	.07	.05½	.07
Red, 500 lb bbls wks	lb.		.07½	.06½	.08	.06½	.07
Resinate, precip., bbls	lb.	.18	.18½	....	....	.....	.....
Stearate, bbls	lb.	.22	.23	....	....	.....	.....
White, 500 lb bbls wks	lb.	.06½	.07	.06	.07	.06	.07
Sulfate, 500 lb bbls wk	lb.		.06	.05½	.06	.05½	.06
Leuna saltpetre, bags c.i f	ton		Nom.	....	Nom.	.....	Nom.
S. points c.i f	ton		Nom.	....	Nom.	.....	Nom.
Lime, ground stone bags	ton		4.50	....	4.50	.....	4.50
Live, 325 lb bbls wks	bbl.		1.70	....	....	.....	.....
Lime Salts, see Calcium Salts							
Lime-Sulfur soln bbls	gal.	.15	.17	.15	.17	.15	.17
Linseed cake, bulk	ton	24.50	25.00	17.50	27.50	.....	.....
Linseed Meal	ton		33.50	28.00	35.70	.....	.....
Lithopone, 400 lb bbls lc-l wks	lb.	.04½	.05	.04½	.05	.04½	.05
Logwood, 51°, 600 lb bbls	lb.	.08½	.12½	.05	.12½	.05	.08
Solid, 50 lb boxes	lb	.13½	.17½	.08	.17½	.08	.12½
Sticks	ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl	ton	58.00	60.00	46.00	60.00	50.00	60.00
Magnesium Carb, tech, 70 lb. bags NY	lb.	.05½	.06½	.05¾	.06½	.05¾	.06½
Chloride flake, 375 lb. drs c-l wks	ton	34.00	36.00	34.00	36.00	35.00	36.00
Imported shipment	ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY	ton		31.00	....	31.00	.....	31.00
Fluosilicate, crys, 400 lb bbls wks	lb.	.10	10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls	lb.		.42	....	.42	.....	.42
Heavy, 250 lb bbls	lb.		.50	....	.50	.....	.50
Palmitate, bbls	lb.	.21	.22	....	....	.....	.....
Peroxide, 100 lb cs	lb.	1.20	1.25	1.00	1.25	1.00	1.25
Silicofluoride, bbls	lb.	.10	.11	.08¾	.11	.09½	.10½
Stearate, bbls	lb.	.19	.20	.16½	.20	.16½	.26
Manganese Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.19
Chloride, 600 lb casks	lb.	.07	.08	.07	.08	.07	.08½
Dioxide, tech (peroxide) drs	lb.	.03¾	.06	.03½	.06	.03½	.06
Linoleate, lig. drums	lb.	.18	.19	....	....	.....	.....
Resinate, fused, bbls	lb.	.08½	.08½	....	....	.....	.....
precip., bbls	lb.	.11½	.12½	....	....	.....	.....
Sulfate, 550 lb drs NY	lb.		.08	.07	.08	.07	.08
Mangrove 55%, 400 lb bbls	lb.		.04	....	.04	.....	.04
Bark, African	ton	27.00	28.00	22.00	30.00	21.00	25.00
Marble Flour, bulk	ton	12.00	13.00	12.00	13.00	12.00	15.00
Mercurous chloride	lb.	.77	.82	.67	.82	.67	.93
Mercury metal, 76 lb flask	66.00		67.00	48.00	67.00	47.00	74.50
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-toluidine 200 lb. bbls	lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb. bbls	lb.	.80	.84	.80	.84	80	.84
Meta-toluene-diamine, 300 lb. bbls	lb.	.67	.69	.67	.69	.67	.69
Methanol, (Wood Alcohol)							
*Crude, tanks	gal.		.20	.20	.20	.....	.....
95% tanks	gal.	.33	.35	.33	.35	.33	.35
97% tanks	gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drums cars	gal.		.39½	.37½	.39½	.37½	.41½
*Synthetic tanks	gal.		.35½	....	.35½	.....	.35½
*Denat. grade, tanks	gal.		.40	.35	.40	.....	.....
Methyl Acetate drums 82%	gal.	.12	.13	.12	.13	.12	.17½
99%	gal.		.15	....	.15	.....	.15
Acetone, drums	gal.	.54	.56	.42	.56	.47	.55
Hexyl Ketone, pure	lb.		1.20	....	1 20	.....	1.20
Anthraquinone	lb.	.65	.67	.65	.67	.65	95
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)							
Chloride, 90 lb cyl	lb.	.45	.45	.45	.45	45	.45
Mica, dry grd. bags wks	lb.	65.00	80.00	65.00	80.00	65.00	80.00
Miehler's Ketone, kegs	lb.		2.50	2.50	3.00	.....	3 00
Molasses, blackstrap, tanks f.o.b. N. Y.	gal.	.06½	.07	.04½	.07	.....	.....
Monochlorobenzene, drums see, Chlorobenzene, mono	lb.						
Monomethylparaminosulfate 100 lb drums	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags	lb.	.08½	.09	.03½	.09	.03½	.07
Myrobalans 25%, liq bbls	lb.	.03½	.04½	.03½	.04½	.03½	.04½
50% Solid, 50 lb boxes	lb.	.05	.05½	.05	.05½	.05	.05½

*delivered basis (east of Miss. River) †As of Sept. 1, $2.56

Current

Myrobalans
Phenyl-Alpha-Naphthylamine

	Current Market	1933 Low	1933 High	1932 Low	1932 High
J1 bags.....ton	31.00	32.00	27.00	35.00	34.00	35.00
J2 bags.....ton	20.00	20.50	15.50	22.75	15.25	18.50
R2 bags.....ton	20.00	20.50	15.00	22.00	14.75	17.50
Naphtha. v.m.& p. (deodorized)						
tanks, Group 3 tanks...gal.	.06	.06½	....	....	.....	.....
Bayonne, tanks.....lb.....		.09½	.08½	.09½	.08½	.10
Naphthalene balls, 250 lb bbls						
wks.....lb.	.06	.07	.05½	.07	.03¾	05½
Crude, imp.....100 lb.	1.81	1.85	1.75	1.85	.....	.....
Crushed, chipped bgs wks...lb.		.05	....	.05	.....	.04½
Flakes, 175 lb bbls wks.....lb.....		.07¼	....	.07¼	.03¾	.04¼
Nickel Chloride, bbls.....lb.	.17	.18	.17	.18	.18	.20
Oxide, 100 lb kegs NY.....lb.	.35	.37	.35	.37	.35	.40
Salt bbl. 400 bbls lb NY...lb.	.12	.13	.11	.13	.10½	.13
Single, 400 lb bbls NY.....lb.	.12	.12	.11	.12	.10½	.12
Metal ingot.....lb.	.35	.35	.35	.35	.35	.35
Nicotine, free 40%, 8 lb tins, cases.....	8.25	10.15	....	....	.....	.....
Sulfate, 55 lb. drums.....lb.	.67	.75	.67	.75	.74½	.....
Nitre Cake, bulk.....ton	12.00	14.00	10.00	14.00	10.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.09*	.09½	.09	.09½	.09	.09½
Nitrocellulose, c-l-l-cl, wks....lb.	.27	.33	.27	.33	.25	.36
Nitrogenous Material, bulk unit.....		2.35	1.50	3.50	1.35	1.55
Nitronaphthalene, 550 lb bbls.lb.	.24	.25	.24	.25	.....	.25
Nitrotoluene, 1000 lb drs wks.lb.	.17	.18	.14	.18	.14	.15
Nutgalls Aleppy, bags.....lb.....		.18	....	.18	.....	.18
Chinese, bags.....lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground.....ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole.....ton	20.00	23.00	20.00	23.00	20.00	23.00
Extract, 25% tannin, bbls..lb.	.03¾	.03½	....	....	.....	.....
Orange-Mineral, 1100 lb casks NY.....lb.....		.10½	09½	.10½	.09½	.10½
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs....lb.	1.00	1.15	1.00	1.15	1.15	1.50
Orthochlorophenol, drums....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums.....lb.	.13	.15	.13	.15	.13	.22
Orthodichlorobenzene, 1000 lb. drums.....lb.	.05½	.06	.05½	.06	.07	.10
Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.28	.29	.28	.29	28	29
Orthonitrotoluene, 1000 lb drs wk.....lb.	.05½	.06	.05½	.06	.14	.18
Orthonitrophenol, 350 lb dr...lb.	.52	.80	.52	.90	.85	.90
Orthotoluidine, 350 lb bbl lc-l.lb.	.14½	.20	.14½	.22	.20	22
Orthonitroparachlorphenol, tins.....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals.....lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid.....lb.	.07	.07¾	.06	.07¾	.06	.07½
Powdered, 100 lb bags.....lb.	.14½	.15	.14½	.15	14½	.15
Paraffin, refd, 200 lb cs slabs						
123-127 deg. M. P.....lb.	.041	.043	.02	.043	.02½	.03
128-132 deg. M. P.....lb.	.045	.047	.03½	.047	.....	.03½
133-137 deg. M. P.....lb.	.05½	.05½	.043	.05½	.04	.04¾
Para Aldehyde, 110-55 gal drs.lb.	.20½	.23	.20½	.23	.20½	.23
Aminoacetanilid, 100 lb bg..lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs.....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kegs...lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums.....lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drums..lb.....		.....	....	....	.....	.....
Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks.....lb.	.16	.18	.15	.18	.15½	.16
Nitroacetanilid, 300 lb bbls.lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks.....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs wks.....lb.	.23½	.24	.23½	.26	.23	.26
Nitro-orthotoluidine, 300 lb. bbls.....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls....lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb. bbls.....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls...lb.	.29	.31	.29	.31	.29	.31
Phenylenediamine, 350 lb bbls.....lb.	1.25	1.30	1.15	1.30	1.15	1.20
Toluenesulfonamide, 175 lb bbls.....lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk..lb.....		.58	....	.58	.42	.43
Paris Green, Arsenic Basis 100 lb kegs.....lb.....		.24	....	.24	.24	.27
250 lb kegs.....lb.....		.23	....	.23	.23	.25
Persian Berry Ext., bbls.....lb.	.25	Nom	.25	Nom	.25	Nom.
Pentane, normal, 28-38° C, group 3, tanks.....gal.....		.07	....	....	.....	.....
Pentasol (see Alcohol, Amyl)...						
Pentasol Acetate (see Amyl Acetate).....						
Petrolatum, Green, 300 lb bbl.lb.	.01¾	.02	.01¾	.02	.02	.02¼
Petroleum Ethers, tanks 30-60°, Group 3.....gal.....		.10	....	.10	.....	.....
Petroleum solvents and diluents						
Cleaners' naphtha, Group 3, tanks.....gal.	.06½	.07	.05	.07	.....	.....
Lacquer diluents, Bayonne tanks.....gal.	.12½	.12¾	.12	.12¾	.....	.....
Group 3, tanks.....gal.	.07½	.08	.06¼	.08	.....	.....
Petroleum thinner 47-49 deg. tanks, Group 3.....gal.	.05	.05½	....	....	.....	.....
Rubber solvent, stand. grade tanks, Group 3.....gal.	.06¼	.06½	.05	.06¼	.....	.....
East Coast tanks.....gal.....		.09½	.09	.09½	.....	.....
Stoddard solvents 48-50 deg. tanks, Group 3.....gal.	.05¾	.06	.04½	.06	.....	.....
East Coast tanks.....gal.....		.09½	.09	.09½	.....	.....
Phenol, 250-100 lb drums....lb.	.14½	.15	.14¼	.15	.14½	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs.....lb.....		1.35	....	1.35	....	1.35

*tanks 1c less.

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Acetate of Lime
Acetate of Soda
Acetone C. P.
Methanol
(all grades)
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Denatured Alcohol
Formaldehyde
Borax
Phenol U. S. P.
Benzol
Toluol
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Whiting
Magnesium Carbonate
Magnesium Oxide

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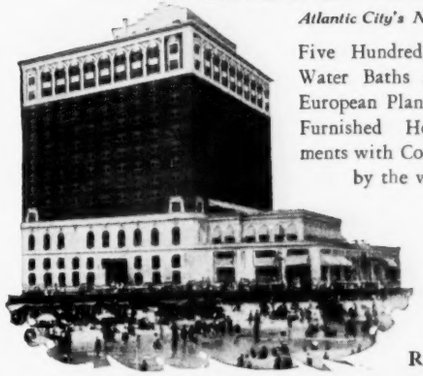

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MARINE SUN DECK
TURKISH BATHS

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HEVEATEX CORPORATION
78 GOODYEAR AVE.
MELROSE, MASS.

Prices

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Phenyl Chloride, drums.....lb.....	.16	....	....	.....	.....
Phenylhydrazine Hydrochloride .....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)					
Phosphate Rock, f.o.b. mines					
Florida Pebble, 68% basis..ton	2.80	3.20*	2.75	3.25	3.10	3.25
70% basis.....ton	3.30	3.70*	3.25	3.90	3.75	3.90
72% basis.....ton	3.80	4.20*	3.75	4.35	4.25	4.35
75-74% basis.....ton	4.85	5.30*	4.75	5.50	5.25	5.50
75% basis.....ton	4.95	5.40*	4.85	5.75	.....	5.75
77-80% basis.....ton	5.75	6.20*	5.75	6.30	.....	6.25
Tennessee, 72% basis.....ton.....		5.00*	....	5.00	.....	5.00
Phosphorous Oxychloride 175 lb cyl.....lb.	.16	.20	.16	.23	.18	.20
Red, 110 lb cases.....lb.....		.45	.40	.45	.40	.46
Yellow, 110 lb cases wks.lb.	.28	.33	.27½	.33	.27½	.37½
Sesquisulfide, 100 lb cs.....lb.	.38	.44	.38	.44	.38	.44
Trichloride, cylinders.....lb.	.16	.20	.16	.23	.18	.20
Phthalic Anhydride, 100 lb bbls wks.....lb.	.15	.16	.15	.16	.15	.16
Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drums or bbls						
Destructive dist.....lb.	.59	.62	.59	.62	.59	.63
Prime bbls.....bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Steam dist. bbls.....gal.....		.59	.52	.59	.54	.61
Pitch Hardwood..... wks.....ton.....		20.00	20.00	25.00	20.00	35.00
Plaster Paris, tech, 250 lb bbls .....bbl.	3.40	3.50	3.30	3.50	3.30	3.50
Platinum, Refined.....oz.....		35.00	24.00	35.00	32.00	38.00
Pontol, tanks .....per gal.....		.54	....	.54	.54	.54
Potash, Caustic, wks, solid...lb.	.07½	07½	.06½	.07½	.06½	.06½
flake.....lb.	.0803	.08½	.0705	.08½	.0705	.08
Liquid, tanks .....lb.....		.03½	....	....	.....	.....
Potash Salts, Rough Kainit 12.4% basis bulk.....ton.....		9.20	....	9.20	.....	9.20
14% basis.....ton.....		9.70	....	9.70	.....	9.70
Manure Salts.....						
20% basis bulk.....ton.....		12.00	....	12.00	12.00	12.65
30% basis bulk.....ton.....		19.15	....	19.15	....	19.15
Potassium Acetate.....lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags.....ton.....		37.15	....	37.15	.....	37.15
Pot. & Mag. Sulfate, 48% basis bags.....ton.....		25.00	25.00	27.80	.....	27.80
Potassium Sulfate, 90% basis bags.....ton.		42.15	42.15	47.50	47.50	48.25
Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks.....lb.	.07¾	.08½	.07¾	.08¾	.07	.08½
Binoxalate, 300 lb bbls.....lb.	.14	.17	.14	.17	.14	.17
Bisulfate, 100 lb kegs.....lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc. 800 lb casks.....lb.	.07	.07½	.04¾	.07½	.0475	.05
Chlorate crystals, powder 112 lb keg wks.....lb.	.08½	.09	.08	.09	.08	.08½
Chloride, crys bbls.....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kegs.....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases.....lb.	.55	.60	.50	.60	.50	.57½
Iodide, 75 lb. bbls.....lb.....		2.70	2.35	2.70	.....	.....
Metabisulfite, 300 lb. bbl...lb.	.10½	.11	.10½	.11	.10½	.13
Oxalate, bbls.....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, casks wks.....lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys 500 & 100 lb drs wks.....lb.....		.17½	.16	.17½	.16	.16½
Prussiate, red, 112 lb keg...lb.....		.35	.32½	.38½	.....	.38½
Yellow, 500 lb casks.....lb.	.16½	.17½	.16½	.17½	.16½	.21
Tartrate Neut, 100 lb keg...lb.....		.21	....	.21	.....	.21
Titanium Oxalate, 200 lb bbls .....lb.	.32	.35	....	....	.....	.....
Propane, group 3, tanks.....		.07	....	.07	.....	.....
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.04	.05
250 lb bbls.....lb.	.04½	.06	.04½	.06	.04½	.06
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.03
Putty, commercial, tubs..100 lb.....		2.25	2.00	2.25	2.00	2.45
Linseed Oil, kegs.....100 lb.	4.00	4.50	3.40	4.50	3.40	4.75
Pyridine, 50 gal drums .....gal.	.85	.95	.85	.95	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk.....unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liquid tks...lb.....		.02⅝	.02	.02⅝	.02	.03
450 lb bbls c-1 .....lb.....		.02½	.02½	.02½	.02½	.03½
Solid, 63%, 100 lb bales cif..lb.....		.03½	.02½	.03½	.02	.02½
Clarified, 64%, bales... lb.....		.03½	.02½	.03½	.02½	.03½
Quercitron, 51 deg liquid 450 lb bbls .....lb.	.05½	.06	.05½	.06	.05½	.06
Solid, 100 lb boxes.....lb.	.09½	.13	.09½	.13	.09½	.13
Bark, Rough.....ton.....		14.00	....	14.00	.....	14.00
Ground.....ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks.....lb.	.40	.44	.40	.44	.40	.44
Red Sanders Wood, grd bbls. lb.....		.18	....	.18	.....	.18
Resorcinol Tech, cans.....lb.	.65	.70	.65	.70	.65	.70
Rochelle Salt, cryst.....lb.....		.12½	....	....	.....	.....
Rosin Oil, 50 gal bbls, first run .....gal.	.45	.46	.42	.46	.41	.45
Second run.....gal.	.50	.51	.46	.51	.45	.51
Rosin						
Rosins 600 lb bbls 280 lb.....unit ex. yard N. Y.						
B.....		4.80	2.75	5.15	2.95	3.65
D.....		4.85	2.95	5.15	3.15	3.75
E.....		4.95	3.55	5.15	3.37½	4.00
F.....		5.00	3.85	5.17½	3.40	4.15
G.....		5.00	3.90	5.17½	3.45	4.15
H.....		5.02½	4.00	5.17½	3.45	4.20
I.....		5.02½	4.05	5.20	3.47½	4.25
K.....		5.05	4.60	5.20	3.60	4.65
M.....		5.05	4.35	5.20	4.20	5.25
N.....		5.10	4.75	5.30	4.65	6.05

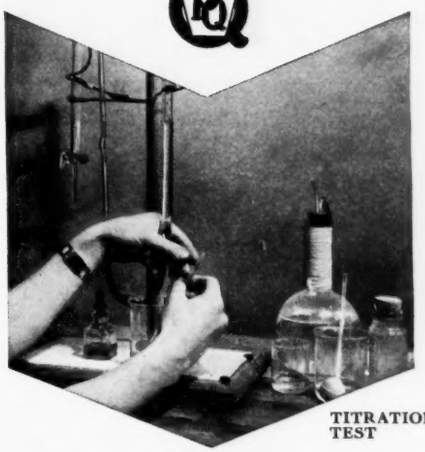
*Higher prices run to Jan.-June 1935.

Current

Rosin
Starch, Potato

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Rosin, WG ton	5.50	4.80	5.60	5.25	6.45
WW	5.50	4.85	6.20	5.85	6.65
Rotten Stone, bags mines ton	23.50	24.00	23.50	24.00	20.00	23.00
Lump, imported, bbls lb.	.05	.07	.05	.07	.05	.07
Selected bbls lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls lb.	.02½	.05	.02	.05	.02	.05
Sago Flour, 150 lb bags lb.	.02½	.03	.02½	.03	.02½	.04
Sal Soda, bbls wks 100 lb.	1.10	1.10	.90	1.10	.90	1.00
Salt Cake, 94-96% c-1 wks ton	13.00	18.00	13.00	18.00	13.00	15.50
Chrome ton	12.00	13.00	12.00	13.00	12.00	14.50
Saltpetre, double refd granular 450-500 lb bbls lb.		.06	.05½	.06½	.06	.06½
Satin, White, 500 lb bbls lb.		.01½	....	.01½	.....	.01½
Shellac Bone dry bbls lb.		.24	.18	.24	.16	.26
Garnet, bags lb.	.17	.18	.15	.20	.15	.20
Superfine, bags lb.	.14	.14½	.09½	.18½	.10	.14
T. N. bags lb.	.13	.13½	.08½	.17½	.09	.13
Schaeffer's Salt kegs lb.	.48	.50	.48	.50	.48	.50
Silica, Crude, bulk mines ton	8.00	11.00	8.00	11.00	8.00	11.00
Refined, floated bags ton	22.00	30.00	22.00	30.00	22.00	30.00
Air floated bags ton		32.00	.....	32.00	.....	32.00
Extra floated bags ton	30.00	35.00	30.00	35.00	30.00	40.00
Silver Nitrate, vials oz.		.29½	....	....	.....	.....
Soapstone, Powdered, bags f.o.b. mines ton	15.00	22.00	15.00	22.00	15.00	22.00
Soda Ash, 58% dense, bags c-1 wks 100 lb.		1.25	1.17½	1.25	1.17½	.....
58% light, bags 100 lb.		1.23	1.15	1.23	1.15	1.20
Soda Caustic, 76% grnd & flake drums 100 lb.		3.00	2.90	3.00	2.90	3.00
76% solid drs 100 lb.		2.60	2.50	2.60	2.50	2.55
Liquid sellers tanks, 100 bls.		2.25	2.15	2.25	.....	.....
Sodium Abietate, drs lb.		.03	....	.03	.....	.03
Acetate, tech 450 lb. bbls wks lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs lb.		.50	....	.50	.....	.50
Arsenate, drums lb.	.07½	.08½	.07½	.08½	.....	.....
Arsenite, drums gal.	.50	.75	.05	.75	.50	.75
Benzoate U.S.P., kegs lb.	.45	.47	....	....	.....	.....
Bicarb, 400 lb bbl 100 lb.		2.25	....	2.25	.....	2.25
Bichromate, 500 lb cks wks lb.	.05½	.07	.044	.07	.044	.05½
Bisulfite, 500 lb bbl wks lb.	.03	.0335	.02½	.0335	.03	.04
Chlorate, wks lb.	.05½	.07½	.05½	.07½	.05½	.07½
Chloride, technical ton	11.40	14.00	11.40	14.00	12.00	13.00
Cyanide, 96-98%, 100 & 250 lb drums wks lb.	.15½	.16	.15½	.16	.15½	.17
Fluoride, 300 lb bbls wks lb.		.07½	.07	.07½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b. wks lb.	.20	.21	.20	.21	.21	.24
Hypochloride solution, 100 lb. cbys lb.		.05	....	.05	.....	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks 100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Technical, regular crystals 375 lb bbls wks 100 lb.	2.40	2.65	2.40	2.65	2.40	2.65
Iodide, lb.		3.50	3.10	3.50	.....	.....
Metanilate, 150 lb bbls lb.	.44	.45	.44	.45	.44	.45
Metasilicate, c-1, wks 100 lb.	2.65	3.05	2.65	3.25	2.85	4.00
Monohydrate, bbls lb.		.02½	....	.02½	.....	.02½
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-1 NY 100 lb.		1.26	1.26	1.31	1.185	1.73½
100 lb. bags lb. ton		25.90	....	....	.....	.....
Bulk ton		23.90	....	....	.....	.....
Nitrite, 500 lb bbls spot lb.	.07½	.08	.07½	.08	.07½	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls lb	.17	.19	.17	.19	.17	.20
Peroxide, bbls. 400 lb. lb.		.17	....	....	.....	.....
Phosphate, di-sodium, tech. 310 lb bbls 100 lb.	2.20	2.40	2.00	2.40	2.00	2.75
tri-sodium, tech, 325 lb bbls 100 lb.		2.60	2.15	2.50	2.15	3.20
Picramate, 160 lb kegs lb.	.69	.72	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bbl wks lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, 100 lb keg lb.	.15	.20	.15	.20	.15	.20
Silicate, 60 deg 55 gal drs, wks 100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40 deg 55 gal drs, wks 100 lb.		.75	....	.75	.....	.75
Silicofluoride, 450 lb bbls NY lb.	.05	.06	.04½	.06	.05½	.06½
Stannate, 100 lb drums lb.	.32	.35	.18	.35	.17	.19
Stearate, bbls lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-1 wks lb.	.02	.02½	.02	.02½	.02	.02½
Sulfide, 80% crystals, 440 lb bbls wks lb.	.02½	.02½	.02½	.02½	.02½	.02½
62% solid, 650 lb drums lc-1 wks lb.	.03	.03½	.03	.03½	.03	.03½
Sulfite, crystals, 400 lb bbls wks lb.	.03	.03½	.03	.03½	.03	.03½
Sulfocyanide, bbls lb.	.28	.35	.28	.35	.28	.35
Tungstate, tech, crystals, kegs lb.	.65	.67	.57	.67	.60	.88
Spermaceti, blocks, cases lb.	.19	.20	.17	.22	.....	.....
Cakes, cases lb.	.20	.21	.18	.23	.....	.....
Spruce Extract, ord., tanks lb.		.01	.00½	.01	.00½	.01
Ordinary, bbls lb.		.01½	.01½	.01½	.01½	.01½
Super spruce ext., tanks lb.		.01½	.01½	.01½	.01½	.01½
Super spruce ext., bbls lb.		.01½	.01½	.01½	.01½	.01½
Super spruce ext. powd., bags lb.		.04	....	.04	.04	.04½
Starch, powd, 140 lb bags 100 lb.	2.69	2.89	2.29	2.95	2.29	2.67
Pearl, 140 lb bags 100 lb.	2.59	2.79	2.19	2.85	2.19	2.84
Potato, 200 lb bags lb.	.05½	.06	.03½	.06	.03½	.06
Imported bags lb.	.06	.06½	.04½	.06½	.04	.06½

P. Q. SILICATE OF SODA



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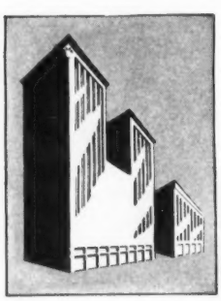

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THE AMERICAN ANNEX
MARKET AT 6TH AND 7TH
ST. LOUIS · MISSOURI

Starch, Potato
Zinc Dithiofuroate

Prices

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Starch, Potato Soluble .....lb.	.08	.08½	.08	.08½	.08	.08½
Rice, 200 lb bbls.....lb.	.07½	.08½	.07	.08½	.07½	.10
Wheat, thick bags.....lb.	.06¼	.06¾	.05¾	.06¾	.06	.07
Thin bags.....lb.	.10	.10¼	.09½	.10¼	.09½	.10
Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY....lb.	.10½	.11	.07	.11	.07	.07½
Peroxide, 100 lb drs.....lb.....		1.25	....	1.25	.....	1.25
Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.....		2.05	....	2.05	.....	2.05
Crude, f. o. b. mines.....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.....		2.40	....	2.40	.....	2.40
Heavy bags c-1.....100 lb.....		2.50	....	2.50	.....	2.50
Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.....		3.45	....	3.45	.....	3.45
Roll, bbls 1c-1 NY....100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs wks.....lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl....lb.	.07	.07½	.07	.07½	.07	.07½
Extra, dry, 100 lb cyl.....lb.	.10	.12	.10	.12	.10	.12
Sulfuryl Chloride.....lb.	.15	.40	.15	.40	.15	.40
Sumac, ground.....ton	66.00	68.00	50.00	68.00	....	.....
Talc, Crude, 100 lb bgs NY..ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bgs NY..ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY....ton	27.50	30.00	18.00	30.00	18.00	22.00
Refined, white, bags....ton	45.00	60.00	35.00	60.00	35.00	40.00
Italian, 220 lb bags to arr..ton	70.00	75.00	48.50	75.00	40.00	50.00
Refined, white bags N.Y.ton	75.00	80.00	50.00	80.00	50.00	55.00
Superphosphate, 16% bulk, wks.....ton.....		8.00	6.50	8.00	7.00	8.00
Run of pile.....ton.....		7.50	6.00	7.50	.....	.....
Tankage Ground NY.....unit.....		2.45*	1.70	2.75*	1.30	1.50
Unground.....unit.....		2.35	2.35	2.60	.....	.....
High grade f.o.b. Chicago.unit.....		1.85*	1.40	3.00	1.00	1.80
South American cif.....unit.....		2.65*	....	2.50	1.80	2.25
Tapioca Flour, high grade bgs.lb	.03	.05	.03	.05	.03½	.05
Medium grade, bags.....lb.	.03	.04	.03	.04	.03	04
Tar Acid Oil, 15%, drums...gal.	.21	.22	.21	.22	.21	.22
25% drums.....gal.	.23	.24	.23	.24	.23	.24
Tartar Emetic, Tech.....gal.....		.21¾	....	....	....	.....
U. S. P.....gal.....		.27	....	....	....	.....
Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bags or bbls...100 lb.	1.00	1.25	1.00	1.25	1.50	2.00
Imported bags.....lb.	.01½	.01½	.01½	.01½	.01½	.01½
Tetrachlorethane, 50 gal dr...lb.	.08½	.09	.08½	.09	.08	.09½
Tetralene, 50 gal drs wks.....lb.	.12	.13	.12	.13	.12	.20
Thiocarbanilid, 170 lb bbl....lb.	.25	.28½	.25	.28½	.25	.28½
Tin.....						
Crystals, 500 lb bbls wks...lb.....		.36½	.24	.37	.22	.25
Metal Straits NY.....lb.....		48.87	.23	48.87	.211	.24½
Oxide, 300 lb bbls wks.....lb.	.50	.52	.27½	.52	.23	.26½
Tetrachloride, 100 lb drs wks .....lb.	.24	.25	.126	.25	.1420	.1457
Titanium Dioxide 300 lb bbl...lb.	.17½	.19½	.17½	.19½	.17½	.21
Calcium Pigment, bbls.....lb.	.06½	.06½	.06½	.06½	.06½	.07½
Toluene, 110 gal drs.....gal.....		.35	....	.35	.....	.35
8000 gal tank cars wks....gal.....		.30	....	.30	.....	.30
Toluidine, 350 lb bbls.....lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks.....lb.	.27	.28	.27	.28	.27	.32
Toner Lithol, red, bbls.....lb.	.80	.85	.80	.95	.90	.95
Para, red, bbls.....lb.....		.80	....	.80	.....	.80
Toluidine.....lb.....		1.35	1.35	1.55	1.50	1.55
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.32	.36
Trichlorethylene, 50 gal dr...lb.	.09½	.10	.09½	.10	.10	.10½
Triethanolamine, 50 gal drs...lb.	.35	.38	.35	.38	.35	.42
Tricresyl Phosphate, drs.....lb.	.19	.26	.19	.26	.21	.26
Triphenyl guanidine.....lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums.....lb.	.37	.39	.37	.39	.50	.65
Tripoli, 500 lb bbls.....100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten. Wolframite..per unit	12.00	12.50	10.00	12.50	10.00	11.75
Turpentine carlots, N. Y. dock bbls. .....gal.....		.46	.46¼	.51½	.39	.47½
Savannah, bbls.....gal.....		.41½	....	....	.....	.....
Jacksonville, bbls.....gal.....		.40½	....	....	.....	.....
Wood Steam dist, bbls....gal.....		.42	.42	.48	.42	.46
Urea, pure, 112 lb cases.....lb.	.15	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f.....ton.....		90.00	82.60	90.00	.....	82.60
c. i. f. S. points.....ton.....		90.00	82.60	90.00	.....	82.60
Urea Ammonia liq. 55% NH_3, tanks,.....unit.....		.96	....	....	.....	.....
Valonia Beard, 42%, tannin bags.....ton	37.00	40.00	27.50	42.00	28.50	34.00
Cups, 30-31% tannin.....ton	23.00	25.00	17.00	25.00	19.00	23.50
Mixture, bark, bags.....ton.....		27.00	22.00	27.00	22.00	26.00
Vermillion, English, kegs.....lb.	1.39	1.42	1.05	1.42	1.28	1.80
Vinyl Chloride, 16 lb cyl.....lb.....		1.00	....	1.00	.....	1.00
Wattle Bark, bags.....ton	30.50	31.00	24.00	32.00	26.00	33.00
Extract 35%, tanks, bbls...lb.	.03½	.03¾	.03	.03¾	.03	.06½
Whiting, 200 lb bags, c-1 wks .....100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-1 NY.....ton.....		15.00	13.00	15.00	.....	13.00
Gilders, bags c-1 NY...100 lb.....		1.35	....	1.35	.....	1.35
Wood Flour, c-1.....bags	18.00†	30.00	18.00	36.00	.....	.....
Xylene, 10 deg tanks wks...gal.	.27	.29	.27	.29	.....	.29
Commercial, tanks wks...gal.....		.26	....	.26	.....	.26
Xylidine, crude.....lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls.....lb.	.04¾	.05	.04¾	.05	.....	5.75
Carbonate Tech. bbls NY..lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks.....lb.	.05	.05¾	.05	.05¾	.05	.06
Gran, 500 lb bbls wks.....lb.	.05¾	.06	.05¾	.06	.05¾	.06
Soln 50%, tanks wks...100 lb.....		3.00	....	3.00	2.25	3.00
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.38	.39
Dithiofuroate, 100 lb dr....lb.....		1.00	....	1.00	.....	1.00

*&10 †Depends upon grade

Current

Zinc Dust
Whale Oil

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Zinc Dust, 500 lb bbls c-l wks ..lb.		.06¾	.04¾	.07½	.041 0525
Metal, high grade slabs c-l NY.....100 lb.		5.12	3.02	5.37	2.87 3.52
Oxide, American bags wk...lb.	.05	.06	.05	.06	.0485 .07
French, 300 lb bbls wks...lb.	.05¾	.11½	.05¾	.11½	.08¾ .11¾
Palmitate, bbls.....lb.	.20	.21	.17½	.21	....
Perborate, 100 lb drs.....lb.		1.25	....	1.25	..... 1 25
Peroxide, 100 lb drs.....lb.		1.25	....	1.25	..... 1.25
Resinate, fused, dark, bbls. lb.	.05¾	.06½	.05¾	.06½	....
Stearate, 50 lb bbls.....lb.	.18	.19	.15	.19	.16 .22
Sulfate, 400 bbl wks.....lb.	.03¼	.03½	.03	.03½	.03 .03½
Sulfide, 500 lb bbls.....lb.	.13	.13½	.12	.13½	.12 .13½
Sulfocarbolate, 100 lb keg..lb.	.21	.22	.21	.22	.21 .24
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.02½ .03
Pure kegs.....lb.	.45	.50	.45	.50	.45 .50
Semi-refined kegs.....lb.	.08	.10	.08	.10	.08 .10

Oils and Fats

Castor, No. 1, 400 lb bbls....lb.		.09¾	.09¼	.10	.09½	.10½
No. 3, 400 lb bbls.....lb.	.09¾	.09	.08½	.09¾	.08½	.10½
Blown, 400 lb bbls.....lb.	.12¼	.12¾	.11¼	.12½	.11¼	.12½
China Wood, bbls spot NY...lb.	.07¾	.08	.04¼	.09¼	.05¼	.07¾
Tanks, spot NY.....lb.	.07	.07¼	.04¼	.08½	.04½	.06¾
Coast, tanks.....lb.	.06¾	.06½	.04⅜	.08¼	.04¼	.06½
Coconut, edible, bbls NY....lb.		.10¾	....	.10½	.....	.10¾
Ceylon, 375 lb bbls NY....lb.	.03¾	.04	.03¾	.04½	.04	.04¾
8000 gal tanks NY.....lb.		.03	.03	.03½	.02¾	.03¾
Cochin, 375 lb bbls NY....lb.	.04½	.04¾	.04½	.05¼	.04½	.06
TanksN Y.....lb.	.04½	Nom.	.04	.05	.03½	.05
Manila, bbls NY.....lb.	.03¾	.04	.04	.04½	.04	.05
Tanks NY.....lb.	.03	.03½	.03½	.03½	.03½	.04
Tanks, Pacific Coast.....lb.	.02½	.02½	.02¾	.03⅜	.02½	.03½
Cod, Newfoundland, 50 gal bbls .....gal.	.34	.35	.19	.35	.21	.30
Copra, bags, N. Y.....lb.	.0145	.0152½	.0152½	.019	.0175	.0235
Corn, crude, bbls NY.....lb.	.05½	.05½	.05½	.07¾	.04½	.09
Tanks, mills.....lb.	.03⅜	.04	.02⅜	.06½	.02¾	.04½
Refined, 375 lb bbls NY...lb.	.06¼	.06½	.06¼	.08¼	.05½	.07
Cottonseed, crude, mill South-east & Valley.....lb.		*(See Oils and Fats News Section)*				
Texas.....lb.		*(See Oils and Fats News Section)*				
Degras, American, 50 gal bbls NY.....lb.		.02¾	.02½	.03	.02½	.04
English, brown, bbls NY...lb.	.03¾	.04	.02¾	.04	.02¾	.04
Greases, Brown.....lb.	.02	.02½	.02	.02½	.01⅜	.02¾
Yellow.....lb.	.02½	.02⅝	.01⅜	.03⅜	.01⅜	.03
White, choice bbls NY.....lb.	.02¾	.02⅞	.02½	.04⅜	.02	.04½
Herring, Coast, Tanks.....gal.	.18	Nom.	.11	.23	.....	.....
Lard Oil, edible, prime.....lb.		.10½	.08½	.10½	.08¼	.10
Extra, bbls.....lb.		.07½	.07½	.08¼	.05¾	.07¾
Extra No. 1, bbls.....lb.	.07¼	.07½	.06	.08	.05½	.07
Linseed, Raw, less than 5bbl. lots lb.		.103	.08	.12	.061	.078
Bbls c-l spot.....lb.		.095	.072	.11	.053	.07
Tanks.....lb.		.089	.066	.104	.047	.064
Menhaden Tanks, Baltimore.gal.	.12	Nom.	.09	.15	.09½	.20
Refined, alkali bbl.....lb.	.065	.071	....	....	....	.....
Tanks.....lb.		.061	....	....	....	.....
Light Pressed, bbls.....lb.	.053	....	....	....	....	.....
Tanks.....lb.		.049	....	....	....	.....
Neatsfoot, CT, 20° bbls NY...lb.		.16½	.11¾	.16½	.11¼	.13½
Extra, bbls NY.....lb.		.07¾	.06½	.08¼	.05¾	.07
Pure, bbls NY.....lb.		.13	.07¾	.14	.07¾	.09
Oleo, No. 1, bbls NY.....lb.		.06½	.05	.06¾	.05¾	.07
No. 2, bbls NY.....lb.		.05¾	.04½	.06⅜	.04¾	.06
Olive, denatured, bbls NY...gal.	.73	.76	.47	.76	.51	65
Edible, bbls NY.....gal.	1.60	1.75	1.30	1.75	1.25	2.00
Foots, bbls NY.....lb.	.06⅛	.06¼	.04⅜	.06¾	.04¼	.05
Palm, Kernel Casks.....lb.	.04	Nom.	.04	.04¾	.035	.04⅜
Lagos, 1500 lb casks.....lb.	.03¾	.04	.02⅜	.04¼	.03	.05
Niger, Casks.....lb.	.03½	.03⅜	.024	.04½	.03	.03½
Peanut, crude, bbls NY.....lb.	.07	Nom.	.03½	.07	.02¾	.04½
Refined, bbls NY.....lb.	.08	.11	.08½	.11	.08¼	.09
Perilla, bbls NY.....lb.	.09	.09½	.05	.10½	.03¾	.05¾
Tanks, Coast.....lb.	.08½	Nom.	.03¾	.09¼	.03½	.05
Poppyseed, bbls NY.....gal.	1.45	1.60	1.45	1.70	1.60	1.75
Rapeseed, lawn, bbls NY...gal.	.0870	.0900	....	....	.....	.....
denatured, drms, NY.....gal.	.44	.46	.34	.65	.....	.....
Red, Distilled, bbls.....lb.	.07	.07⅜	.05⅞	.07⅜	.06½	.07
Tanks.....lb.		.06	.05	.06	.05¼	.06
Salmon, Coast, 8000 gal tks. gal.	.19	Nom.	.11	.18	.11	.19
Sardine, Pacific Coast tks...gal.	.15	Nom.	.09½	.20	.09½	.17½
Sesame, edible, yellow, dos...lb.		.10	.09½	.10	.08½	.09½
White, dos.....lb.	.10	.11	.10	.11	.10	.11
Sod, bbls NY.....gal.		.40	....	.40	.....	.40
Soy Bean, crude.....						
Pacific Coast.....lb.		Nom.	.032	.035	.02¾	.03½
Domestic tanks, f.o.b. mills, lb.		.065	.027	.085	.03	.032
Crude, bbls NY.....lb.	.071	.075	.04	.095	.03¾	.05
Refined, bbls NY.....lb.	.076	.088	.04½	.106	.04½	.06
Sperm, 38° CT, bleached, bbls NY.....lb.	.103	.105	....	....	.....	.....
45° CT, bleached, bbls NY..lb.	.096	.098	....	....	.....	.....
Stearic Acid, double pressed dist bags.....lb.	.09½	.10	.07½	.10	.07½	.09
Double pressed saponified bags .....lb.	.09½	.10	.08	.10	.07	.08¼
Triple, pressed dist bags..lb.	.12¼	.12¾	.10½	.12¾	.10½	.11
Stearine, Oleo, bbls.....lb.	.05½	.05½	.03½	.06¼	.03¾	.06
Tallow City, extra loose.....lb.	.03	.03½	.02	.03½	.02½	.03¾
Edible, tierces.....lb.	.04	.04⅜	.03½	.05½	.03⅜	.04¼
Tallow Oil, Bbls, c-l NY...lb.	.05¾	.06	.05¾	.06	.05¾	.07½
Acidless, tanks NY.....lb.		.06¾	.05	.07¼	.06	.09
Vegetable, Coast mats.....lb.	.05	Nom.	.04½	.06	.06	Nom.
Turkey Red, single, bbls.....lb.	.07½	....	.06¼	.07¼	.06¼	.09
Double, bbls.....lb.	.12½	.13	.08	.13	.08	.11
Whale,.....						
Winter bleached, bbls, NY..lb.		.072	....	....	.....	.....
Refined natural, bbls, NY..lb.	.068	.07	....	....	.....	.....

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